



### کتابچه خلاصه مقالات

پنجمین کنگره بین المللی سلامت همراه

دانشگاه علوم پزشکی و خدمات بهداشتی درمانی شیراز

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### Abstract Book

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## سخن رئیس کنگره:

سلامت جز لاینفک زندگی انسان هاست و کسب اطلاعات صحیح در حفظ، ارتقا و بهبود آن از ضروریات آن، منابع اطلاعاتی در عصر حاضر عمدتاً منابع الکترونیک می باشند و موبایل در دسترس ترین وسیله برای عموم مردم برای مشاهده اطلاعات است. پس این فرصت غنیمتی برای سیاستگذاران سلامت است که از این وسیله در راستای پیشگیری در سطوح مختلف استفاده نمایند. نرم افزارهای تحت موبایل می تواند زمینه را برای تامین اطلاعات صحیح برای مردم، آموزش آنان و مراقبت های لازم را فراهم نماید و در این راستا تامین نرم افزارها و اطلاعات به زبان مادری هر کشوری قطعاً توان اطلاع رسانی پزشکی و بهبود سلامت را در میان عموم مردم آن جامعه افزایش خواهد داد.

پنجمین کنگره بین المللی سلامت همراه امیدوار است با توجه به وقوع پاندمی کووید -۱۹ با معرفی توانمندیهای بین المللی در راستای پیشگیری ، درمان و بازتوانی نیازمندان حرکت نماید.

## سخن دبیر کنگره:

امروزه سلامت همراه (mobile health) یک واژه پر کاربرد در ارائه خدمات پزشکی با استفاده از سامانه ها و اپلیکیشن های تحت موبایل هستند که گسترش این تکنولوژی سبب تأمین امکان ارائه خدمات به بیماران در خارج از مکان درمانی و تسهیل ارائه خدمات ویزیت پزشکان، مشاوره ها و ... شده است. در حال حاضر متقاضیان خدمات آنلاین سلامت به طرز شگفت انگیزی در حال افزایش است؛ به طوری که اپلیکیشن های mhealth در طی چند سال اخیر رشد چشمگیری داشته و از سال ۲۰۱۵ تاکنون به بیش از دو برابر رسیده است که نشان از وجود بازار بالقوه ای در این زمینه است و امکان سرمایه گذاری در این حوزه را فراهم می نماید که استارت آپ ها فراهم کننده این فضا هستند.

در این راستا از اهداف این کنگره معرفی شرکت های دانش بنیان ایده های برتر و اپلیکیشن های حوزه سلامت می باشد که با برگزاری نمایشگاه و استارت آپ ها زمینه این حمایت فراهم گردیده است. پنجمین دوره از این کنگره از فضای خاص علمی برخوردار است، چرا که با توجه به محورهای کنگره بیش از ۹۰ سخنران علمی از ایران و کشورهای مختلف از جمله استرالیا، آمریکا، انگلستان، سوئد، پاکستان، ترکیه و قطر ارائه می گردد. ضمناً کلیه مقالات برگزیده در کنگره امسال در شماره ویژه مجله *Journal of Biomedical Physics and Engineering* چاپ و مقالات برتر کنگره نیز به صورت مقاله کامل در شماره های عادی مجله چاپ می گردند.

نهایتاً حضور اساتید، پزشکان و متخصصان برتر بین المللی در کنار دانشجویان، کار آفرینان و صاحبان ایده ما را به اهداف کنگره در بهبود ارائه خدمات بهتر در حوزه سلامت رهنمون خواهد کرد.

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## معرفی حامی:

امروزه نوآوری به معنای خلق ارزش از علوم و فنون روز رمز بقای تمامی کسب و کار هاست و بنگاه های اقتصادی باید به نوآوری نگاهی حیاتی داشته باشند . کسب و کار های نوپا که فعالیت خود را از یک ایده شروع میکنند برای رشد خود نیاز به خدماتی نظیر راهنمایی و مشاوره صحیح و حمایت مالی به موقع دارند تا همانند یک بذر در محیط مناسب به درختی بارور و پر ثمر بدل شوند . بخش شتابدهنده هاب شیراز با نام تجاری لبخند با در نظر گرفتن قوانین و ترند های روز حوزه سلامت همراه از یک سو و با بهره مندی از سرمایه های انسانی دانشگاه شیراز و نیز حمایت های مالی شرکت سرمایه گذاری خطرپذیر حرکت اول به عنوان سهامداران خود، تالش دارد تا نقش موثری در رشد و توسعه کسب و کارهای سلامت دیجیتال ایفا نماید.





## “Design and manufacture of a mobile-based ECG signal monitoring and analysis device”

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**Background:** This study aims to design hardware that receives and records the ECG signal of the heart and processes it through the signal processor. The system is based on IoT, which sends measurement data wirelessly to the mobile phone.

**Objectives:** Our primary purpose is to give convenient and reliable services to patients, diminish costs and increase efficiency in home healthcare community healthcare.

**Materials and Methods** For designing this device, an ADB8232 sensor, Arduino microcontroller, Arduino platform, and three electrodes are used to receive and process the electrocardiography (ECG) signal, which processes the signals received from the leads after processing via Python and MATLAB. The output of this information can be seen instantly by the doctor and patients on the mobile phone through Arduino and Ubidots cloud space.

**Results:** Using the mobile health method, the doctor can easily control the patient's health condition with minimal waste of time. Being portable, accurate, small, and light are important advantages of this device. It will be a convenient instrument since it shows all the data and data collected exclusively from mobile health.

**Conclusion:** The proposed device would be efficient, cheap, and accurate. In addition, abnormal heart conditions can be notified very quickly. Doctors can increase diagnostic accuracy by connecting to the health care system through IoT since they have all the important persistent information at their fingertips. In brief, it permits remote and continuous patient monitoring.

**Keywords:** ECG signal analysis, mobile-based monitoring, Arduino microcontroller

## “A clinical decision support system of brain tumor classification using deep learning based on image processing”

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**Background:** The use of intelligent medical diagnosis systems in diagnosing brain diseases, as an assistant alongside physicians and radiologists, in addition to helping them, paves the way for accurate and error-free identification to identify and distinguish these diseases from other similar diseases.

**Objectives:** The main goal of this study is to design a clinical decision-making system based on deep learning.

**Materials and Methods:** The brain tumor images dataset was downloaded from the Kaggle database in this study. A total of ۳۰۶۴ MRI images of brain tumor

patients were used. The classification of the images was done in two stages; these stages include the training stage (equal to 90% of the images) and the testing stage (equal to 10% of images). We developed a 2D Convolutional Neural Network (2D-CNN). This network consists of eight convolution layers and four pooling layers, and after all convolution layers, batch-normalization layers were applied. The clinical diagnostic system was created using the Java programming language.

**Results:** The training accuracy of the 2D convolutional neural network is 96.47%, and the testing accuracy is 93.44%. The average precision, recall, and F-measure are 94.70%, 90.70%, and 90%, respectively. The developed net was used as the processing core in the decision support system.

**Conclusion:** The use of a deep neural network in this system by automatically extracting features from the image and increasing the final accuracy of the system made it possible for neurologists to solve very complex problems to a great extent.

**Keywords:** Deep learning, Image processing, Decision support system.

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## “The effect of mobile-based health education on treatment adherence in hemodialysis patients”

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**Background:** Recently, mobile applications have received a lot of attention in patient education due to their advantages including saving time and low costs compared to other educational methods.

**Objectives:** The present study aimed to investigate the effect of a mobile-based health education intervention on adherence to the treatment regimen in hemodialysis patients admitted to teaching hospitals in Zahedan in ۲۰۲۲.

**Materials and Methods:** This quasi-experimental study was conducted with a random block design (N=۸۰). In addition to routine training, the participants in the intervention group received health education in five areas of treatment adherence using a smartphone application (My Dialysis) developed by the researcher. The participants in the control group received only routine training. The data were collected by administering a demographic information form, the Media Literacy Questionnaire, and the End-Stage Renal Disease-Adherence Questionnaire (ESRD-AQ) before the intervention and three months after the intervention. The collected data were analyzed by SPSS software (version ۲۶).

**Results:** The mean treatment adherence scores were significantly higher among the dialysis patients in both intervention and control groups after the intervention than before the intervention ( $P \leq 0.05$ ).

**Conclusion:** The use of smartphone applications is effective in reducing the complications of the disease and improving treatment adherence among hemodialysis patients.

**Keywords:** Health Education, Mobile Applications, Treatment Adherence, Hemodialysis.



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## “Development and implementation of an online calculation tool for relapse risk prediction in ulcerative colitis”

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**Background:** Ulcerative colitis (UC) is a relapsing gastrointestinal disease. Identifying patients at high risk of UC relapse and initiating preventive treatment can reduce the risk of UC recurrence and its dangerous side effects.

**Objectives:** The present study was performed to design and implement an online calculation tool for relapse risk prediction in UC.

**Materials and Methods:** This study is based on our previous prospective study on 107 in-remission UC patients. We designed an online website rooted in our pre-developed equation for calculating relapse risk scores. Then, 280 UC patients who were not in relapse were randomly selected from our database, and required information was filled in on the website, accordingly. Finally, the indicators were manually calculated using the formula and compared with online-calculated data.

**Results:** The developed bilingual website is available at <http://www.ucrelapserisk.com>. Of 280 UC patients, 101 (36.1%) were male, and the mean age of the total participants was 44.7 years. The median (interquartile range) of the UC relapse risk score and probability of relapse in one year was 0.00

(۳-۷) and ۷۰٪ (۲۳-۹۵٪), respectively. Thirty-five percent of patients were at high risk of relapse in the following year. There were no differences between the manually and online calculated Seo index, UC risk score, and probability of relapse in one year.

**Conclusion:** This online tool is now available for patients and clinicians and provides an accurate relapse risk prediction for UC patients.

**Keywords:** Ulcerative Colitis, Risk score, Online calculation tool



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## “Mental health response to COVID-19 pandemic in Iran and mHealth solutions”

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**Background:** The COVID-19 is an emerging pandemic caused by the SARS-CoV-2. During pandemics, people experience stress and anxiety to some extent, and psychological disorders become common.

**Objectives:** This study aimed to investigate negative impacts of COVID-19 on Iranian mental health as well as offer mHealth solution to alleviate it.

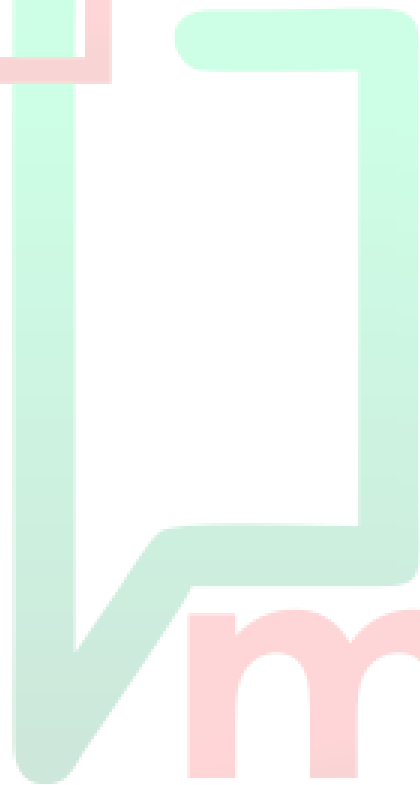
**Materials and Methods:** An online survey was designed using DASS-21 questionnaire. Data were analyzed using multivariate regression models.

**Results:** Finally, 1498 participants filled the questionnaire using snowball sampling. Results showed that 60.8%, 42%, and 22.2% of participants experienced some level of stress, anxiety and depression respectively.

**Conclusion:** Various studies have shown the effectiveness of digital health solutions for mental health problem. These solutions include mHealth (mobile and web-based apps, and social media), as well as Telehealth and Telemedicine (remote consultations and videoconferences) to name a few. These technologies can help people to access right care every place, any time.

**Keywords:** COVID-19, Mental Health, Telemedicine

2021



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## “E-learning during COVID-19 pandemic: A systematic review of systematic reviews”

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**Background:** The current outbreak of COVID-19 has led to a rapid shift in student education style from face-to-face to online learning.

**Objectives:** This systematic review aimed to synthesize the available literature on application of E-learning among students during COVID-19 pandemic.

**Materials and Methods:** The authors systematically searched online databases including PubMed, Scopus, Web of Science and conducted a manual electronic search of google scholar from ۲۰۱۹ to ۲۰۲۲. Keywords used for searching included “Virtual learning”, “Virtual education”, “E-learning”, “Web-based learning”, “Online learning”, “online class”, “distance learning”, “systematic review”, “COVID-۱۹”, “۲۰۱۹-novel coronavirus”, “۲۰۱۹-nCoV”, and “SARS-CoV-۲”. Two authors independently screened titles, abstracts and full texts, and performed data extraction for included articles. Disagreements were resolved by a third author.

**Results:** A total of ۱۰۲ articles were retrieved from the databases, and ۸ additional papers were extracted from google scholar. After removing duplicates, we screened ۱۰۰ titles and abstracts according to our criteria. Finally, ۱۶ full-text articles were reviewed. our research showed successfully transition from face-to-face to online methods and applied different educational technology solutions during current pandemic. Studies revealed different solution such as technology-enhanced learning, simulation-based learning, technology-based clinical education, mobile learning, blended learning, discussion forums, video clips, and pre-recorded videos.

**Conclusion:** E-learning plays an important role in university students’ education for now and in the future. It should be noted that the transition to online learning will have a profound effect on traditional education. Moreover, some efforts should be tried to improve student education, security, and technology of e-learning platforms.

**Keywords:** Online Education, COVID-۱۹, Education Distance, Systematic Review, Student;

## “Telemedicine for Follow-up of Patients After Liver Transplantation”

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**Background:** Telemedicine can provide face-to-face communication for specialized healthcare services, thus eliminating the need for the doctor and patient to be in the same location.

**Objectives:** Our aim was to investigate the effectiveness of telemedicine for follow-up management after liver transplantation.

**Materials and Methods:** This is a review study which was done in 2023. Searching was performed in online databases and search engines including PubMed, Scopus, Science

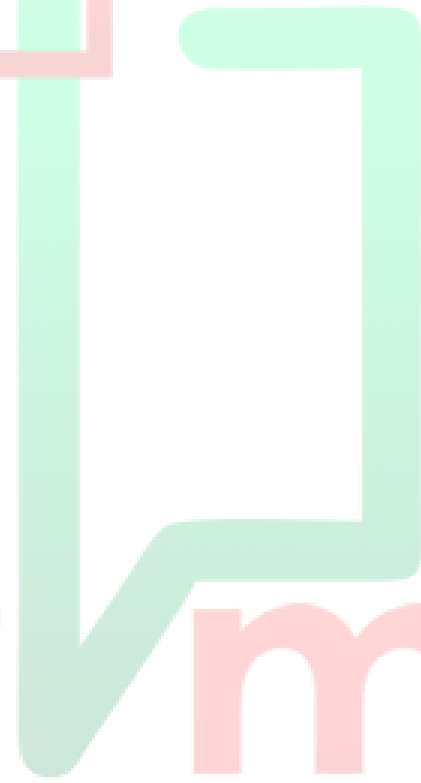
Direct and google scholar. Finally, 9 articles from 30 were selected which met our eligibility criteria and were included in this study.

**Results:** The findings of this research showed that telemedicine had potential to improve the quality of life, survival rates, rapid recovery and facilitate achieving clinical outcomes. It also promotes patient self-management and medication adherence. Moreover, telemedicine led to lower hospital readmissions and decrease the length and expenses of the initial hospitalization.

**Conclusion:** Telemedicine interventions showed a chance to personalize care and can lead to improved patient adherence and satisfaction.

**Keywords:** liver transplantation, Telemedicine, Follow-Up Studies

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## “Information requirements of a mHealth-based self-management application for liver transplant recipients”

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**Background:** Liver transplantation is an elective treatment for patients with end-stage liver disease. Patients after liver transplants may experience a decrease in physical, cognitive, and mental functions. To help these patients, specialists should provide targeted education to patients, help them create a healthy lifestyle, strengthen physical activity and improve self-efficacy. Continuous education allows patients to better understand their health status and strengthens their self-management.

**Objectives:** The objective of this study is to compile the information requirements of liver transplant recipients.

**Materials and Methods:** This research is a qualitative study that was conducted in 2022. To compile information requirements, 20 liver transplant recipients were interviewed in a face-to-face, semi-structured and in-depth manner. Inclusion criteria: Liver transplant recipients of Abu Ali Sina Transplantation Hospital, adults, patients who were able to participate in the interview, or companions of the patient who were responsible for the patient's health and were aware of the patient's condition. Exclusion criteria: patients' unwillingness to cooperate. Participants signed a consent form before the interview. All interviews were recorded and transcribed into a word document, then analyzed.

**Results:** The information requirements of liver transplant recipients have been divided in 9 general categories including medical and pharmaceutical education for self-management, post-transplant care, how to deal with problems (recognition of medicine side effects, diabetes, primary disease recurrence, transplant rejection, and re-transplantation), healthy lifestyle (nutrition, exercise, hygiene), mental health and dealing with depression after liver transplantation.

**Conclusion:** Identifying the information requirements from the patient's point of view will be effective for the user-oriented development of the self-management application.

**Keywords:** Liver Transplantation, Information, mHealth, Self-management



## “Bi-directional Long Short Term Memory: A New Temporal model for Improving Human Activity Recognition in IoT-Based Housing for Elderly”

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**Background:** In last decade, in parallel with the expansion of the use of IOT in the field of health, its use in recognizing activities of the elderly who live alone has also been proposed. One of the main challenges of this technology is similarity of the signals which are captured from different activities.

**Objectives:** The aim of this article is utilizing Bi-directional Long Short-Term Memory (i.e., Bi-LSTM) which makes use of two independent temporal modeling together which leads the system to have both backward and forward information about the human activity signals, therefore may promote recognizing of human activities.

**Materials and Methods:** The tests were performed on Wireless Sensor Data Mining (WISDM) dataset including signals recorded from walking, jogging, upstairs, downstairs, standing and sitting activities. The basic LSTM were applied on above signals in parallel with Bi-LSTM to compare their accuracies.

**Results:** The obtained results showed that Bi-LSTM reached to average accuracy of 93.04% in distinguishing several activities. The obtained accuracy by using basic LSTM were 89.46%. The highest increase in accuracy has been achieved for two

critical activities upstairs and downstairs, whose accuracy level by LSTM was 77,80% and 83,18%, while using Bi-LSTM increased these values up to 99,20% and 98,42% respectively.

**Conclusion:** Increasing of the recognition rate by using the proposed method specially for critical activities shows its effectiveness in IOT-based elderly health monitoring systems which may promote the level of public health.

**Keywords:** Housing for the Elderly, Internet of Things (IoT), Artificial Intelligence, Human Activities.



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## “Investigating the effect of an educational program based on the theory of planned behavior on the promotion of drug abuse prevention behaviors in male students: the application of mobile health”

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**Background:** Adolescence is the most dangerous period of life in terms of starting to use drugs. The purpose of this study is to use the theory of planned behavior in improving drug abuse prevention behaviors in high school male students using mobile apps.

**Methodology:** This study was conducted in two stages: the first stage of this study, a descriptive-analytical and cross-sectional study to examine the determinants and predictors of substance abuse based on the theory of planned behavior (TPB) in 220 students. Then, based on the results of a cross-sectional study, an educational intervention was conducted on 100 high school students (50 in each group) in 2019. The educational intervention for the intervention group was carried out for 8

weeks with applications and programs installed on mobile phones at weekly intervals based on the constructs of the TPB theory. and collected three months after the intervention.

**Results:** TPB constructs predicted 31.4% of behavioral intention. There was no significant difference between the two groups in attitude, mental norms, perceived behavioral control, intention to prevent substance abuse and behavior before the educational intervention. However, three months after the intervention, the experimental group showed a significant increase in each of the mentioned constructs ( $P < .05$ ).

**Conclusion:** The results showed that the education of teenagers was effective in the prevention of substance abuse. Therefore, it is suggested to design and implement educational-counseling programs through mobile health programs based on behavior change theories.

**Keywords:** High School Students, Substance Abuse, Theory of Planned Behavior, Mobile Health

2023

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## “Evaluation of Persian-language Diet-Recommendation Mobile Applications”

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**Background:** The increment in society's health-related awareness encourages individuals to seek nutrition consultations. An easy and cost-benefit way to access dietary modification recommendations is to use mHealth approaches and diet-recommending mobile applications.

**Objectives:** We aimed to evaluate Persian-language diet-recommending mobile applications.

**Materials and Methods:** In this descriptive study, Google Play was searched for android diet-recommending mobile apps. Apps in the Persian language which were scored higher than ۴ were assessed. Applications were reviewed for their interface

and user-friendliness, as well as clinical-related items such as obtaining food recall, physical activity level, calculating BMI, and recommending calories. Also, dietary recommendations of applications were assessed for ۶ sample cases (male and female in BMI categories of normal weight, overweight, and obesity), and were compared with standard clinical dietitian approaches.

**Results:** Among the five eligible applications, ۴ apps asked about physical activity levels, ۲ about disease history, ۳ about medical conditions like pregnancy/lactation, ۱ about consuming supplements, and ۲ about food preferences and allergies. Among them, ۴ reported BMI and recommended calorie requirement. There were remarkable differences in the application's recommended calories with calories calculated using standard formulas. In the meantime, none of the apps recorded the food recall. On the other hand, some applications were able to register fluid intake, provide a calorie counter option, and record daily physical activity.

**Conclusion:** Available Persian-language diet-recommending apps had limitations in providing sound nutrition recommendations. It is better to engage nutritionists in the design phase of applications to recommend a more precise diet.

**Keywords:** mHealth, Mobile applications, Diet therapy, Nutritionist, Persian.

## “The Hamyar-e-Payvand® self-care application adoption, usage and user satisfaction level in the liver transplant recipients”

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**Background:** As liver transplant (LTX) recipients face many complications, providing a comprehensive education is essential in their management during. A recently developed self-care application, Hamyar-e-Peyvand, provides a platform

for patients after LTx to find information about drugs, physiotherapy, nutrition, psychology and infection control aspects following LTx.

**Objectives:** This study aims to evaluate the level of adoption, usage and user satisfaction of this software among patients received LTx.

**Materials and Methods:** This is a prospective cohort study. After explaining software to 31 LTx recipients, 27 patients accepted application usage (Acceptability: 87.1%). Patients were asked to read contents within two weeks, followed by evaluating the usage level and self-reported interestingness, engaging, fun and attractiveness of the software by the patients as well as their prediction in future use and overall score to the application and their level of suggestion to the others.

**Results:** Patients used the application in  $75.1 \pm 59.7$  minutes. Most of the patients reported moderate interestingness and high fun for the use of the software, which 60% of them suggested application using to the others. Also, most of them (55.6%) predicted using this tool until the next 12 months. The level of usage by the patients and their score to the application was higher in patients had been gone under LTx less than one month ( $P < 0.05$ ).

**Discussion:** The Hamyar-e-Peyvand self-care application is useful with a high acceptance rate among LTx recipients. Use of this software is highly recommended in patients immediately after LTx.

**Keywords:** Application, Patient education, Self-care, Digital health, Liver transplant.



## “Decreasing Preschooler's Nutrition risk via educational nutritional Mobile-Based Game”

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**Background:** Nutritional behaviors are formed in childhood and transferred to adulthood. In developing countries, children are the most vulnerable population in dietary transition. Nutrition risk is defined as habitual characteristics or risk factors leading to impaired nutritional status, a spectrum from under to over-nutrition. Early identification of children at risk of nutrition can result in early intervention. Gamification is an appropriate educational strategy at this age. Nowadays, mHealth interventions as a low-cost, reliable, and accessible method substitute for physical games.

**Objectives:** This article aims to report a mobile-based nutrition education game (Kid Food) on nutrition risk, and anthropometric indicators of 0-6-year-old children

**Materials and Methods:** This project had 6-month single-blinded parallel randomized controlled trial performed on 120 Iranian preschoolers. After the initial measurements, the children were assigned randomly to an intervention or control group. Before and after education via KidFood, anthropometric indices of the children were assessed. Nutrition risk was calculated using by Persian version of the Nutrition Screening Tool for Every Preschooler (NutriSTEP).

**Results:** The results show no difference in the weight gain of both the intervention and control groups, but the height gain in the intervention group is significantly higher ( $P=0.003$ ). Comparing the NutriSTEP score in both groups at the end of the study showed a significant difference between the two groups ( $P=0.008$ ). Also, this score decreased significantly in the intervention group ( $P<0.001$ ).

**Conclusion:** This study showed that nutrition education via mobile-based games could decrease nutritional risk and so better height growth of children.

**Keywords:** Mobile-based game, Gamification, NutriSTEP, Preschoolers.

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## “The effect of mobile training on learning and satisfaction of clinical residents at Shiraz University of Medical Sciences”

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**Background:** Education via mobile is one of the methods of virtual education that received more attention at Corona crisis. The training course for junior clinical residents was also implemented in Education Development Center with the focus on mobile education.

**Material and Methods:** This study was interventional (descriptive-analytical) and cross-sectional. The statistical population was all junior residents' participants in this course (378 people) as the census. A WhatsApp group was organized with the presence of all course professors and residents, and sessions were held as (online and mobile training). In order to measure the learning rate of the residents, a pre-test-post-test was conducted. A questionnaire with 32 questions with 75% Cronbach's alpha reliability and confirmation validity by medical education experts.

The pre-test, post-test was measured with a questionnaire and the level of satisfaction was measured by the checklist in the WhatsApp group.

**Results:** 60% of the participants were women and 40% were men. The average overall scores in the pre-exam was 15.08 and in the post-exam was 16.91 out of 32. Measuring the amount of learning of residents through mobile was reported positive and significant ( $t = 12.86$ ,  $p = 0.001$ ). The satisfaction rate of the participants was 92% in the two areas of scientific level and applicability of the content.

**Conclusion:** This training of residents with the focus on mobile education has been lead to improving the learning and satisfaction. It seems that the development of this method is an undeniable necessity of the society.

**Keywords:** Education, Mobile, Residents, Satisfaction

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## “The effect of mobile-based education on empowering cardiovascular patients for better Medication adherence”

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**Background:** Medication adherence is one of the most significant factors in optimally controlling cardiovascular disease.

**Objectives:** The aim of this study was to determine the effect of mobile based education on medication adherence of cardiovascular patients

**Materials and Methods:** In this quasi-experimental study, participants were 45 patients discharged from CCU ward of Ali ebn Abitalib hospital in 2020, Rafsanjan, Iran. Participants randomly allocated into intervention or control groups by simple randomization. For five weeks, the intervention group received weekly medication adherence educational package using a smart phone through the WhatsApp messenger. The control group received routine care. Data collected using demographic questionnaire and Morisky drug adherence scale, before and three

months after the intervention. The data were analyzed by SPSS 21 software, using independent samples t-test, Chi-square test and repeated measures ANOVA.

**Results:** The drug adherence scores of the intervention group ( $6.63 \pm 1.71$ ) significantly increased than control group ( $5.29 \pm 1.85$ ) three months later ( $P=0.006$ ). There was no statistically significant difference between groups, before and one month after the intervention. Also, the intra-group comparison showed that the mean score of medication adherence at different times in the education group, was different and significantly improved three months after the intervention ( $p= 0.006$ ), while no difference was seen in the control group ( $p=0.665$ ).

**Conclusion:** Mobile based education through WhatsApp Messenger promote the drug adherence of cardiovascular patients. Therefore, utilizing this method may be a practical solution toward enhancing the drug adherence of cardiovascular patients

**Keywords:** Medication Adherence, Cell Phone, Cardiovascular Diseases, Patient discharge

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## “Telemedicine effects on pregnant womens stress during COVID-19 pandemic”

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**Background:** The COVID 19 pandemic has influenced on prenatal care in all over the world. In Iran, maybe because of pregnant women’s fear of COVID-19 transmission, face to face prenatal care were decreased and mostly provided by telemedicine during the pandemic in order to assure quality and persistence of care, in addition to mothers’ safety.

**Objectives:** The aim of the present study was to determine Telemedicine effects on pregnant women’s stress during COVID-19 pandemic.

**Materials and Methods:** This before-after study performed on 60 pregnant women during January and February, 2021 in the Ebne Sina health center, Tabriz. These pregnant women filled on-line Perceived Stress Scale (PSS) questionnaire which had acceptable reliability and validity in Persian before and after receiving the training content by Mobile App. The maximum and minimum scores in the questionnaire were 0 and 04, respectively. The Independent samples t test was applied to compare stress score before and after the intervention among women in SPSS software version 16.

**Results:** The mean age (SD) of 60 pregnant women was 24,8(2,0) years. This study demonstrated that the mean of stress score was 26,04±4,33 and decreased

to  $16,3 \pm 3,87$  after intervention. This reduction in stress score among pregnant women was statistically significant ( $p=0,001$ ).

**Conclusion:** This study showed that training pregnant women by mobile app could reduce their stress score during COVID-19 pandemic. So, the use of this type of care among pregnant women was recommended.

**Keywords:** Telemedicine, COVID-19, Pregnant women.



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## “The mediating role of the use of educational electronic tools in the relationship between fatigue and sleep quality of medical teachers”

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**Background:** In recent years, the use of electronic educational tools such as computers, laptops and mobile phones for teaching medical students has been widely developed by medical teachers.

**Objectives:** This study was conducted with the aim of determining the mediating role of the use of educational electronic tools in the relationship between fatigue and sleep quality of medical teachers.

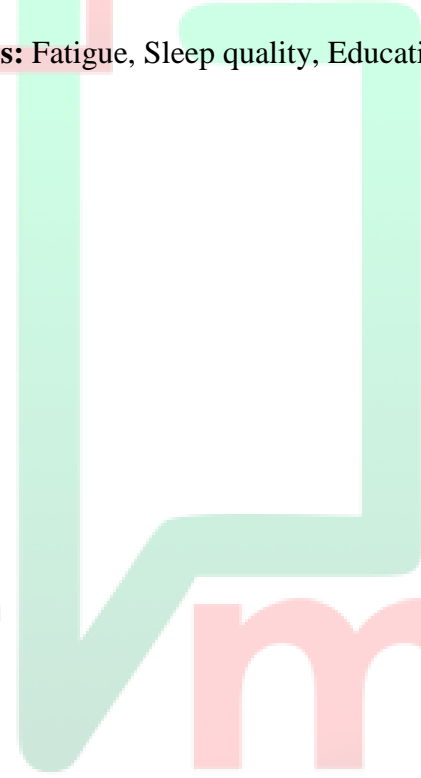
**Materials and Methods:** The current study was a cross-sectional study. Three hundred medical teachers of Shiraz University of Medical Sciences participated in this study. The data were measured using a numerical scale of fatigue and sleep quality. Data analysis was done using Smart PLS-3 software and the model fit was assessed. Then direct, indirect and total effects were presented.

**Results:** The findings of this study showed that there was a direct effect between the use of educational electronic tools and physical fatigue ( $t = 5.53$ ,  $P < 0.001$ ) and mental fatigue ( $t = 3.32$ ,  $P = 0.001$ ). Moreover, there was a direct effect between sleep quality and mental fatigue. The results showed that the use of electronic educational tools by medical teachers did not play a mediating role in the relationship between fatigue and sleep quality.

**Conclusion:** The findings of this study indicated that the use of electronic educational tools was associated with mental and physical fatigue of medical teachers. Identification of other factors related to fatigue and sleep quality of medical teachers is suggested in future studies.

**Keywords:** Fatigue, Sleep quality, Educational electronic tools

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## “The effect of educational intervention using mobile based multimedia training method on communication skills of nurses”

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**Background:** Nurses are one of the most important members of the health team who spend more time with patients, so communication skills are essential to provide comprehensive care and effective communication.

**Objective:** The aim of this study was Determining the effect of educational intervention using mobile based multimedia training method on communication skills of nurses.

**Materials and Methods:** The present study was performed by Semi-experimental method. 197 nurses working in Trauma Hospital who included the inclusion criteria were included in the study. The educational intervention included by using mobile based multimedia training method. Data collection tools included two questionnaires "Demographic information and communication skills of Queen Dam". Data were analyzed using SPSS software version 22 and statistical tests.

**Results:** Most of the participants in the study were women (70,1%), age 20-30 years (41,6%), bachelor's degree (91,9%). Mean total score of communication skills before (97,09) , next (111,41) , one month later (111,94). The mean scores of skill variables such as "ability to receive and send messages, emotional control , listening , insight into the communication process " before and after the intervention are statistically significant difference (p-value < 0,05).

**Conclusion:** Educational intervention using mobile based multimedia training method has an effect on communication skills of nurses and can improve nurses' communication skills. It is also very important to increase nurses' awareness about communication skills. It is suggested that this method should be used to improve the skills of nurses and other members of the health team.

**Keywords:** education, communication, nurses

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## “The role of problem-solving skills education using a mobile -based multimedia method on anxiety caused by covid-19 in nursing students: a semi-experimental study”

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**Background:** Problem solving skills play an important role in the mental and physical health of students, especially when they face a crisis such as the Covid pandemic.

**Objective:** The aim of study was determining the role of problem-solving skills education using a mobile -based multimedia method on anxiety caused by covid-19 in nursing students.

**Materials and Methods:** This quasi-experimental study was conducted on 66 nursing students of Shiraz University of Medical Sciences who were randomly selected and randomly divided into intervention and control groups. Multimedia educational content was provided to participants in the intervention group during 3 sessions of 30 minutes through virtual networks with the help of smart phones. The data collection tool included demographic information questionnaire and anxiety scale caused by corona disease. The data was analyzed using SPSS version 21 software.

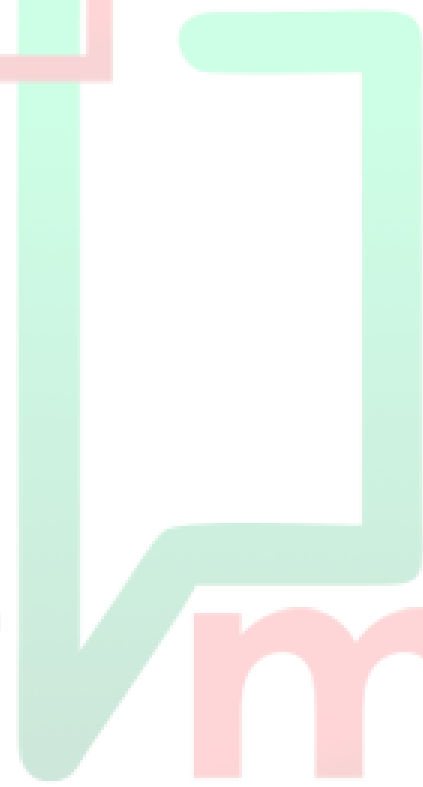
**Results:** A significant difference was observed in the intervention group in the time periods immediately ( $p=0.03$ ) and 1 month after the intervention ( $p<0.001$ ). In

addition, the average score of psychological and physical factors of anxiety caused by covid-19 decreased significantly in the intervention group compared to the control group after the intervention ( $p < .001$ ).

**Conclusion:** It is necessary to pay more attention to the health status and reduce the anxiety level of nursing students as an important part of the health team and plan to reduce their anxiety. It is suggested that the training of problem solving skills be implemented periodically in higher education centers for students of different levels.

**Keywords:** problem solving, anxiety, nursing

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## “Usability Evaluation of a Self-care Covid-۱۹ Mobile Application; A study of the Northwest of Iran”

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**Background:** Patients with covid-۱۹ (PWC) are infected by the virus of corona and must be aware of self-care instructions to improve their situation. Mobile health applications have been developed to provide educational information on self-care, self-management, and self-monitoring.

**Objectives:** The purpose of this study was to evaluate the usability of a mobile-based self-care application for PWC.

**Materials and Methods:** This was a cross-sectional study conducted to determine the usability of a mobile-based self-care app for PWC in Khalkhal of Iran in the ۲۰۲۱ year. Patients with covid-۱۹ who had mild symptoms and did not need hospitalization and acute conditions were included in the study voluntarily. The

end-users of the mobile app that used it for at least three weeks were asked to return their feedback on the mobile app using the QUIS questionnaire (Version 0.0). QUIS is a standard questionnaire to assess users' subjective satisfaction with specific aspects of the human-computer or mobile interface. Data analysis was performed using SPSS version 22.

**Results:** The statistical population and users' participation was (N=60 patients) and 01 questionnaires be completed. The questionnaire consists of five aspects include; system Capabilities (Mean user score=7.0), Learning(Mean=7.9), Terminology and System Information(Mean=7.8), Screen(Mean=8.1), Overall Reaction to The Software(Mean=7.7). Mobile app usability evaluation showed that users evaluated the application as good level with a total mean score of 7.8 (out of 9 points).

**Conclusion:** Mobile health apps enable patients to be aware of their situations but need to be designed to be highly attractive and acceptable.

**Keywords:** Mobile app, Mobile health, Covid-19, Self-care, Evaluation

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## “Design and Evaluation of a Mobile Oral Health Application for Children and Adolescents with Congenital Heart Defects”

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**Background:** Congenital heart defects (CHDs) are the most common type of birth defect. Affected children and adolescents with CHD require special care in dentistry because of their susceptibility to infective endocarditis from poor oral hygiene infections.

**Objectives:** This study aimed to design a smartphone application (app) and evaluation for education of children and adolescents with CHD regarding oral healthcare.

**Materials and Methods:** Present study was a descriptive developmental study. The application was elaborated for the Android™ platforms. First, the data required in this study for information needs assessment and application design were collected by searching library resources and approved by pediatric cardiologists specialize and pediatric dentists. Then, to evaluate usability, a test method composed of observation and interview surveying was used, and the measuring mechanism consisted of the User's Success Rate. The sample (N = 00) was randomly composed

of children and adolescents with CHD (3-18 years of age) from the Pediatric Cardiovascular Research Center in Isfahan, Iran.

**Results:** In the effectiveness tests, the success rates of the educational content, training video and images, story, and game menus were 98%. The satisfaction evaluation rate was 100%.

**Conclusion:** The application was successful regarding the following three assessed attributes: (1) effectiveness, (2) efficiency, and (3) satisfaction. Therefore, oral health education by a mobile app was observed to be useful and necessary for children and adolescents with CHD and their parents.

**Keywords:** Oral Health, Mobile Applications, Heart Defects, Congenital

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## “Evaluating the implementation result of patient Telemonitoring Ecosystem considering PASAD Product: A Pilot Case Study in Yazd Province”

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**Background:** Monitoring the health of people in society is important from two aspects of screening and follow-up treatment. Since there is no general telemonitoring ecosystem in the health area of Iran, a considerable number of patients with chronic illnesses are facing multiple difficulties. Evaluating solutions that are designed and implemented by software companies and startups around the world is helpful.

**Objectives:** This study is delivering the result of piloting a telemonitoring ecosystem, called PASAD, associated with Type ۱ diabetes in the Yazd province.

**Materials and Methods:** The employed methodology in this study is based on the Dresden Ecosystem Management Method (DREEM). *In the first phase*, the general objectives of the ecosystem, constraints, and potential users of the platform were identified. *In the second phase*, the architecture of the telemonitoring platform was

developed, and thereby the required services and resources were implemented. *In the third phase*, a set of mechanisms are defined to assure the successful performance of the ecosystem and finally assess the underlying business model.

**Results:** The pilot study of the ecosystem was modeled in Yazd province by the collaboration of ten patients, three supporters, one nurse, and two doctors using software and hardware-based infrastructure. The results revealed that the quality of patients' life is enhanced owing to the decreased levels of hypoglycemia and hyperglycemia.

**Conclusion:** The robustness of the provided structure of this ecosystem can be extended to chronic diseases. Additionally, the promising results have satisfied patients, nurses, and doctors to eagerly welcome the utilization of PASAD.

**Keywords:** Health Ecosystem, Patient Telemonitoring, Nursing Center, Telemedicine, Telenursing.

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## “The effect of smart phone application on women's health beliefs about breast self-examination”

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**Background:** Breast Self-Examination (BSE) is a simple and inexpensive method for early diagnosis of breast cancer. An application that educate individuals and remind them about BSE may exert positive impacts on women's beliefs in this field.

**Objectives:** To determine the effect of a smartphone application on women's health beliefs regarding BSE.

**Materials and Methods:** In this quasi-experimental study, 100 women referring to therapeutic clinics in Jahrom, Iran were randomly assigned to an intervention or a control group. The intervention group participants had access to a smartphone application including BSE reminder, training, alarm, and feedback to the therapist. The application also contained educational movies and self-assessment. The study data were collected using Champion's Health Belief Model Scale (1984) and BSE information record form before and four months after the intervention. Data were analyzed using descriptive statistics, independent t-test, Chi-square, Mann-Whitney, and Wilcoxon tests.

**Results** After the intervention, the mean differences of the scores of perceived susceptibility ( $1,03 \pm 2,60$  vs.  $0,0 \pm 0,0$ ,  $p=0,001$ ), BSE barriers ( $2,80 \pm 0,32$  vs.  $0,0 \pm 0,0$ ,  $p=0,001$ ), self-efficacy ( $1,00 \pm 0,63$  vs.  $-2,2 \pm 0,44$ ,  $p=0,001$ ), and health motivation ( $2,77 \pm 3,70$  vs.  $-0,0 \pm 2,63$ ,  $p=0,001$ ) were significantly higher in the intervention group compared to the control group. However, no significant difference was observed between the two groups with regard to perceived severity and BSE benefits after the intervention.

**Conclusion:** Access to the smartphone application enhanced the participants' health beliefs regarding BSE in the areas of perceived susceptibility, self-efficacy, and health motivation. Therefore, the use of this application is recommended to improve women's health beliefs in this field.

**Keywords:** Breast cancer, Breast self-examination, Cellular phone, Health behavior, Health belief model, mHealth

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## “The effect of mobile text messages on self-efficacy and success in quitting smoking in patients after angioplasty”

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**Background:** Smoking is an important modifiable cardiovascular risk factor that increases the possibility of recurrence of coronary artery stenosis after angioplasty. Moreover, quitting smoking improves the health of patients with cardiovascular diseases.

**Objectives:** To determine the effect of educational-persuasive text messages on self-efficacy and success in smoking cessation in patients after coronary angioplasty.

**Materials and Methods:** This quasi-experimental study was conducted in three cardiac care units in Shiraz, Iran. 100 patients after having angioplasty were divided randomly into intervention and control groups. Then 32 educational-persuasive text messages about quitting smoking were sent to the intervention group during two months. The control group received only routine training. Both groups filled out the smoking status questionnaire, success in quitting smoking and Smoking Abstinence

Self-Efficacy Questionnaire before and after the intervention. Data were analyzed using Chi-square tests, independent t-test, and paired t-test.

**Results:** The results revealed that success in quitting smoking in the intervention group ( $n=29, 71.7\%$ ) was significantly greater compared to that of the control group ( $n=2, 4.3\%$ ) ( $p<0.001$ ). Also, after intervention, the mean score of self-efficacy in the intervention group ( $11.01 \pm 4.70$ ) was significantly higher than the control group ( $6.01 \pm 3.11$ ) and also higher than before the intervention ( $0.01 \pm 2.44$ ) ( $P<0.001$ ).

**Conclusion:** The educational-persuasive messages for quitting smoking can influence self-efficacy in quitting smoking in patients after angioplasty effectively and boost their success in this process. Therefore, it is recommended that similar programs as an applicable and economic method for enabling these patients in quitting smoking be utilized.

**Keywords:** Cardiovascular Diseases, Coronary Balloon Angioplasty, Learning, Text Messaging, Self-Efficacy, Smoking Cessation

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## “Virtual Reality Applications for Patients with Hemophilia: A Review”

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**Background:** Virtual Reality (VR) is a computer technology that simulates real environments and circumstances and is employed in some healthcare contexts, including chronic diseases. people with hemophilia require timely treatment and rehabilitation due to the long course of these disorders.

**Objectives:** The objective of this paper was to conduct a review of published studies in the field of VR application in hemophilia for treatment and rehabilitation.

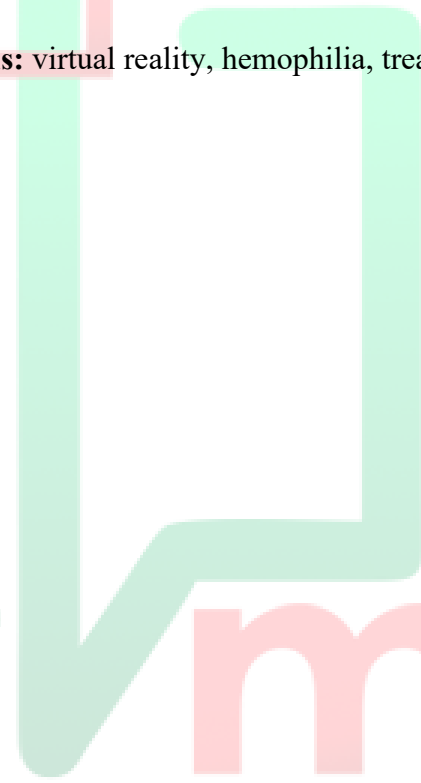
**Materials and Methods:** The present study was a review of articles in Pubmed and Science Direct databases without a time limit using the keywords Virtual Reality AND Hemophilia were performed. Then, to evaluate the quality of the collected articles, two researchers reviewed the articles in terms of title, abstract, introduction, methodology, results, and discussion. Finally, 3 main articles were selected based on inclusion, exclusion, and quality evaluation criteria.

**Results:** Most studies reveal positive results from virtual reality. It is a practical and effective tool in the treatment of people with hemophilia. In addition, the findings of this review showed that virtual reality technologies are low-cost and versatile and can be effective for clinical rehabilitation in health care and home environments.

**Conclusion:** VR and interactive devices led to the development of comprehensive, portable, accessible, and usable systems for some hemophilia disease interventions. Emerging VR technologies and tools are expected to facilitate the development of advanced applications in the future and have a significant impact on patient well-being.

**Keywords:** virtual reality, hemophilia, treatment

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## “Mobile Applications for Self-care of Celiac Diseases: A Review”

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**Background:** Celiac disease (CD) is a digestive disorder characterized by poor food absorption. The disease cannot be prevented, but with ongoing education and adherence to a gluten-free diet (GFD), people can live a normal life without difficulty. Self-care applications have focused on issues such as nutrition counseling, encouraging people to follow their diets and prescriptions regularly, and assisting patients to continue living normally.

**Objectives:** The purpose of the paper was to review published studies on the utilization and effectiveness of smartphone applications in managing patients with CD.

**Materials and Methods:** We searched PubMed, ISI, ProQuest, Science Direct, Google Scholar, and SID for the keywords "Celiac Disease", "Coeliac disease", (Self Care), "Self-Care " AND Mobile app for studies published from January 2012 through December 2022. The inclusion criteria were full-text English articles. Exclusion criteria were studies that were reviews or non-English language. Finally, 10 main articles were selected based on inclusion, exclusion, and quality evaluation criteria.

**Results:** Mobile applications can provide useful information. The use of mobile applications can play an important role in changing the lifestyle of the CD. Improving health behaviors such as increasing patients' knowledge and adherence to a gluten-free diet, diet modification, self-management, self-efficacy, improving quality of life, and medication adherence are results of mobile applications used for celiac diseases.

**Conclusion:** The usage of mobile applications helps patients become more conscious of their condition, adhere to their diet, and effectively manage their disease's symptoms since celiac sufferers need ongoing education.

**Keywords:** celiac disease, mobile application, self-care

## “Development of the Minimum Data Set for the Iranian National Obesity Registry (IRNOR)”

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**Background:** Due to the increasing prevalence of obesity, and the multiplicity of treatment strategies, a registration system can help to effectively record patients' nutritional information, the contributing factors and treatment's efficacy and

complications. A standard tool recommended for data collection is applying an established minimum data set.

**Objective:** To develop a minimum data set that can be applied to register overweight and obese patients.

**Material and methods:** A preliminary data set was collected based on the related literatures and comparative studies. Classification of data elements was conducted by three nutrition experts. Data set was validated using three rounds of Delphi method. Finally, a set of data was designed as the minimum data set. A web-based platform was applied to design the questionnaire. The server programming language was PHP (Laravel Framework).

**Results:** ۱۴۶ data elements including personal information, medication history, family medical history, history of smoking, anthropometric measurement, nutritional information, diagnostic item, and a ۲۴-hour recall were selected as the minimum data set.

**Conclusion:** The obesity registration system database was designed in accordance with international standards and can be integrated with the Iranian National Obesity Registry. We will provide this database to help facilitate data collection and improve results in future studies. This database will be presented as a rich repository of data.

**Keywords:** Registry, Obesity, Delphi

## “The Iranian national obesity registry (IRNOR): Results of the first phase”

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**Background:** The global obesity prevalence and its comorbidities have elevated significantly in recent decades. Registries are designed to evaluate patient care,

technology assessment, and public health. According to the increasing prevalence of obesity and overweight in Iran.

**Objectives:** To set up the Iranian national obesity registry to assess the prevalence, contributing factors and treatment strategies of obesity in Iranian population.

**Material and methods:** Its a cross-sectional study. During the IRNOR first phase (2017-2019), volunteer adults (aged above 18 years) who were overweight (BMI  $\geq 25$ ) or obese (BMI  $\geq 30$ ) were included. All participants were referred from a nutrition clinic in Mashhad. A comprehensive web-based questionnaire designed via the Delphi technique was completed. Patients received a routine restricted-calorie diet with or without medications. In order to evaluate the health outcomes, clinical data were collected and reported at follow-up visits by 3 and 6-months.

**Results:** One thousand sixty individuals were registered on the IRNOR website, of which 68.9% were women. The average BMI and abdominal circumference (AC) were  $26.0 \pm 6.1$  and  $110.1 \pm 8.6$  cm, respectively. Non-alcoholic fatty liver disease (NAFLD) was the most prevalent associated medical condition (26.0%). During the 3-months follow-up, weight, fat mass, fat percent, abdominal fat, and AC decreases were significantly higher in men than women. Although during 6-months follow-up, only abdominal fat and AC decreases were still significant.

**Conclusion:** The IRNOR as an established national registry provides a unique sample of overweight and obese adults and represents a standard database that covers both characteristics and treatment strategies.

**Keyword:** Obesity, Registry, Delphi technique



## “Application of Virtual Reality in Hospitals: A Systematic Review”

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**Background:** Virtual Reality (VR) technology can play an effective role in providing health care services by creating simulated, interactive and realistic environments.

**Objectives:** The present study aims to investigate the application of VR in hospitals.

**Materials and Methods:** A search was performed by using the main keywords "Virtual Reality", "Hospital" and their synonyms in Web of Science, PubMed, and

Scopus databases and Google Scholar engine until August 10, 2022. The original articles published in English that dealt with "the application of virtual reality in the hospital" were included in the study and their characteristics were examined.

**Results:** 11 articles were included in the present study. These studies have been conducted in China (3 studies), America (3 studies), Canada (3 studies), the Netherlands, Spain, Belgium, Australia, and Taiwan. The users of VR technology in these studies were patients (6 studies), healthcare providers (3 studies), elderly people (1 study), residents (1 study), and one study was a joint survey between patients and doctors. The applications of VR technology in hospitals were managing behavioral symptoms, creating relaxation, inducing positive emotions in patients and healthcare workers, rehabilitating the physical, mental, and emotional health of patients, and providing tutorials to healthcare providers. Also in one article, VR technology was used as an adaptive substitute for experiences in the natural environment for residents.

**Conclusion:** The result of reviewing articles shows that users were satisfied with the experience of using VR. It is suggested that this technology be used as an auxiliary tool to improve healthcare services.

**Keywords:** Virtual Reality, VR, Hospital, Systematic review

## “The effectiveness of mobile applications in the management of liver transplantation: A Systematic Review”

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**Background:** Liver transplant recipients need self-management until the end of their lives, and the use of these applications is recommended for disease management.

**Objectives:** The purpose of this study is to systematically investigate the effectiveness of applications developed in the management of liver transplantation.

**Materials and Methods:** This was a systematic review in which we systematically searched PubMed, WOS and Science Direct with liver transplant ‘Smartphone App and mobile health applications keywords for studies that designed, introduced, and worked on the effectiveness of liver transplant applications. We included all relevant studies published in English between December 1990 and December 2022.

**Results:** Of 916 articles initially retrieved, 4 were included for detailed review. Some of the most important features of applications; providing educational tips for better understanding of health status, information related to healthy lifestyle such as improving sleep quality, sports activities and providing medication reminders for home rehabilitation, promoting immunization before transplantation. The operating system used in all 4 applications was iOS and Android. Most studies have stated that liver transplant applications have the potential to become a valuable tool for home rehabilitation and are practical tools.

**Conclusion:** The use of mobile phone applications has a positive effect on the management of liver transplant patients. Considering the low rate of organ donation, health policymakers should use appropriate interventions and strategies through mobile applications to improve adherence to self-management of transplant recipients and reduce costs.

**Keywords:** Smartphone, Mobile Application, liver Graft, Liver Transplantation

## “A review of the use of mobile health and virtual reality (Metaverse) in various fields of medicine and health”

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**Background:** Metaverse is an emerging technology in the digital space and a combination of several technologies such as artificial intelligence, virtual reality, etc., through which new paths can be provided to provide quality health services and treatments.

**Objectives:** The purpose of this study was to review of the use of mobile health and virtual reality (Metaverse) in various fields of medicine and health

**Materials and Methods:** This narrative review study carried out with searching Persian and English full texts in PubMed, Web of Science, Scopus and Google Scholar databases in the time range of ۲۰۱۲ to ۲۰۲۲ and based on the keywords (Mhealth ,Health, Medicine, Metaverse). The quality assessment of the studies was done using the recommended tools of the Joanna Briggs Institute. The method of data analysis was qualitative content analysis.

**Results:** After removing duplicate and unrelated articles, ۱۱ articles were selected. Data analysis led to the emergence of two main categories of "**health care services**" with six subcategories (health assessment and maintenance, medical diagnosis and treatment, communication between health providers and patients, effective care in crises, Simulation of health protection protocols, mental health) and "**services in medical education**" with four subcategories (Digital education, health care education, surgical methods' education, simulation of triage skills).

**Conclusion:** Our findings provide insight into the various services of mhealth and metaverse in the field of medicine and health. It is suggested that the relevant officials in the development of educational programs and health promotion consider it.

**Keywords:** Mhealth, Technology, Medicine, Health

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## “A review of the effectiveness of mobile health programs in controlling cancer symptoms”

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**Background:** Patients undergoing anti-cancer treatment experience annoying side effects. Mobile technology can improve access to health services, and systems Strengthen health to face challenges related to cancer.

**Objectives:** The purpose of this study is to review the effectiveness of mobile health programs in controlling the symptoms of cancer patients

**Materials and Methods:** The current research is a narrative review. In order to carry out the study, articles available in Google Scholar, PubMed, MEDLINE, Scopus, Web of Science databases in the time range of ۲۰۱۲ to ۲۰۲۲ and based on the keywords: symptoms, cancer, mhealth Checked out. The qualitative evaluation of the studies was done using the evaluation and criticism tools of the Joanna Briggs Institute. The method of analyzing the data in the articles was qualitative content analysis.

**Results:** The number of related articles was ۳۰, after removing, ۱۲ articles were selected for review. Data analysis led to the emergence of two main categories

"control of physical symptoms of cancer" with four subcategories (increasing the amount of self-care, reduction of pain and fatigue, optimal sleep, self-efficacy of pain management) and "control of psychological symptoms of cancer" with three subcategories ( upgrade the quality of life, improvement of body image, proper psychological cognitive function).

**Conclusion:** Integrating mHealth into the cancer care chain may be an effective strategy to improve cancer care and improve outcomes for cancer survivors. Considering the various positive effects of mhealth in cancer, it is recommended that it be included in the educational and treatment programs of these patients.

**Keywords:** cancer, mhealth, symptoms

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## “Explanation of mobile health services and its challenges from the perspective of nurses: a qualitative study”

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**Background:** Mobile health is a rapidly growing new technology that has the potential to improve patient education, prevent disease, improve diagnosis and treatment, reduce health care costs, increase access to health care services, and advance evidence-based research.

**Objectives:** To describe mobile health services and its challenges from the perspective of nurses at Guilan University of Medical Sciences.

**Materials and Methods:** This research was a qualitative study that was conducted on 16 nurses working in hospitals of East of Guilan. purposeful sampling continued until data saturation . Data was collected by semi-structured interviews. The data were analyzed using conventional qualitative content analysis by MAXQDA 2007 software.

**Results:** Data analysis led to the emergence of two main category and 4 sub-category. The main categories include mobile health services (subcategories:

companion doctor, health status registration, warning to see a doctor, reducing burnout of the health care team) and challenges of using mobile health (subcategories: high cost, uncertainty in using it for specific patients, insufficient training to use, the possibility of increasing the error).

**Conclusion:** Mobile health technology provides programs to improve health management and health behavior change. By understanding its potential to change the vision of providing health interventions, nurses can benefit from developing strategies for patient care.

**Keywords:** mobile health, nurse, qualitative study

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## “Telenursing in Disasters”

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**Background:** Telenursing refers to the use of telehealth technology in the nursing profession, which is consistent with the basic philosophy of health care. The goal of telenursing is to provide clinical support, overcome geographical barriers and increase the efficiency of people's health.

**Objectives:** The purpose of this study is to provide suitable solutions for using remote nursing technology for disaster management to reduce the amount Injuries and help to rehabilitate the victims, which was done in 2022

**Materials and Methods:** In this research, a review method was used among numerous articles in Google Scholar, SID, Magiran and Pubmed databases. Searched keywords included nursing, remote, disasters, Telenursing and Telehealth. The search period was from 2010 to 2022, and all searching and screening steps were performed by two people.

**Results:** In period of disasters, the tasks that should be prioritized include: life-saving measures, care and decision-making in stressful situations (triage), handling trauma victims, technical skills, handling patients with special needs, and psychological and emotional support. Cost-effective health care technologies in low and middle income countries can range from smartphone apps (to improve pre-

hospital care) to electronic data collection and analysis (to improve quality), telemedicine. , drones/robots (supporting remote areas and optimizing resources during day-to-day care and disasters), flexible medical and surgical facilities using mobile (such as battery-powered CT scanners).

**Conclusion:** Empowering nurses to use consulting applications and providing telenursing services during sudden disasters like Corona can help in providing clinical care to patients.

**Keywords:** Nursing, Disasters, Telenursing

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## “Benefits of virtual reality for autism patients: a systematic review”

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**Background:** Autism is a very common neurodevelopmental disorder with extensive individual and societal costs. In the last two decades, the use of virtual reality for autism patients has been the subject of many studies, however, more studies are needed to reach a common understanding of the benefits of this technology. Therefore, this study was conducted with the aim of investigating the benefits of virtual reality for autism patients in ۲۰۲۲.

**Objective:** The aim of this systematic review is the benefits of virtual reality for autism patients.

**Materials and Methods:** PubMed, Scopus, and Web of Science databases were searched from ۲۰۱۷ to September ۱۴, ۲۰۲۲ to identify English language studies related to the purpose of the research. The included studies were evaluated for quality and risk of bias using the CASP criteria by two authors. All non-English

studies, non-original studies and studies that were not related to our purpose were excluded.

**Results:** Of 1000 retrieved articles, 11 met the inclusion criteria. The benefits of virtual reality included: improvement in the expression and regulation of emotions, social-emotional interaction, improvement of communication and executive performance, training of driving skills, development of flexibility, identity and norm building, treatment of fear, improvement of responsibility and occupational rehabilitation.

**Conclusion:** Virtual reality can bring many benefits to autism patients, but consistent validations are needed in future studies to determine whether virtual reality can effectively complement traditional treatments.

**Keywords:** Virtual Reality, VR, Autism

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## Effectiveness of rehabilitation in the elderly using virtual reality: a systematic review

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**Background:** Aging has become a global challenge; therefore, the evaluation and treatment of the elderly has gained special importance. Recently, efforts have been made to implement virtual reality to support the provision of geriatric rehabilitation, and it is important to examine the available research evidence on the effectiveness of this technology. Therefore, this study was conducted with the aim of investigating the effectiveness of virtual reality rehabilitation on the elderly in 2022.

**Methods:** PubMed, Scopus, and Web of Science databases were searched from 2017 to September 27, 2022 to identify English-language studies related to the purpose of the research. The included studies were evaluated for quality and risk of bias using the STROBE check list by two authors. All non-English studies, non-original studies and studies that were not related to our purpose were excluded.

**Results:** Of 3100 retrieved articles, 8 met the inclusion criteria. Our findings showed that virtual reality has the potential of physical, cognitive, emotional and social rehabilitation of the elderly. In fact, virtual reality increased the number of steps and walking speed, improved balance and neuropsychological symptoms, as well as increased daily activities, posture control, muscle strengthening, independence, and more.

**Conclusion:** Virtual reality has been recognized as an excellent intervention tool for the rehabilitation of the elderly, showing the capacity of its multidimensional approach and helping to reduce symptoms associated with physical and cognitive impairments.

**Keywords:** Virtual Reality, rehabilitation, elders.

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## The use of mobile applications in pregnancy mental health: a systematic review

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**Background:** Mother's mental health affects the health of parents and the development of children. There are many mental health mobile apps available that have the potential to improve health and enhance the pregnancy experience. However, therapists and women know little about them. Therefore, this study was conducted with the aim of investigating the use of mobile applications in the mental health of pregnancy in 2022.

**Objective:** The purpose of this systematic review is the use of mobile phone applications in mental health during pregnancy.

**Methods:** PubMed, Scopus, and Web of Science databases were searched from 2015 to September 1, 2022 to identify English studies related to the purpose of the study. The included studies were evaluated for quality and risk of bias using the CASP criteria by two authors. All non-English studies, non-original studies and studies that were not related to our purpose were excluded.

**Results:** Out of 4000 retrieved articles, 10 met the inclusion criteria. Pregnancy mental health mobile applications included: BrightSelf, Baby Buddy, IHypnobirth, Music for Pregnancy Relaxation, and Pregnancy Yoga Exercises, which have been used for diagnosis, prevention, screening, and treatment of prenatal anxiety and depression, relaxation training, and mood management.

**Conclusion:** App developers and obstetricians should seek advice from women who experience mental disorders in pregnancy to optimize apps. Future studies should include psychological treatment, perinatal continuity of care, and clinical sustainability to realize the potential of mobile applications.

**Keywords:** Mobile application, pregnancy mental health, m Health.

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## “Designing an intelligent dry eye self-management system using images from the keratograph 5 and OSDI questionnaire”

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**Background:** Dry eye disease is a progressive multifactorial disease on the surface of the eye and leads to symptoms of discomfort and visual impairment. In order to prevent, it is necessary to involve patients using smart system as a cost-effective solution to promote self-management of the disease. Considering the multifactorial nature of the disease and helping doctors to better diagnostic, use a Subjective and objective assessment methods to provide personalized education.

**Objectives:** The purpose of this study is design an intelligent dry eye educational system based on the keratograph 5 device and OSDI questionnaire.

**Materials and Methods:** The study phase of designing a smart system was carried out in 3 stages. Library studies were reviewed to determine the requirements used in self-management systems. commercial applications were reviewed in Google Play and App Store. the electronic outpatient records of dry eye patients in two

referral Eye centers were reviewed and the minimum data set that was completed by ophthalmologist was extracted.

**Results:** the smart system with 5 main parts of history and health records, appointment reminder, personalized training based on grade and history, OSDI questionnaire to determine the symptoms of this disease, clinical tests and imagings 5-keratograph device including eyelid meibography, NITBUT, eye redness, tear meniscus height and health charts were designed.

**Conclusion:** The use of mHealth has been proven to be an effective means of supporting self-management efforts and helping to reduce the challenges that patients and primary care providers experience.

**Keywords:** mhealth, dry eye, self-management, ophthalmic imaging, OSDI

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## “Privacy and Security of Health Information in Mobile Health”

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**Background:** Due to the increase in the use of mobile devices in the health field, the importance of implementing health information management policies related to security and privacy should be considered.

**Objectives:** The aim of this study is to review the mobile health concept, investigating the security and privacy challenges of health information in mobile health and providing effective solutions to control the access levels of users.

**Materials and Methods:** This review study conducted in 2022, and its information are obtained from searching in Google Scholar, Iran Medex, Magiran, SID, PubMed.

**Results:** Recent advances in mobile health applications have created many challenges regarding security and privacy policies. Many mobile devices have made the health information of patients accessible to other people.

**Conclusion:** Mobile application developers have not fully paid attention to the principles of security and privacy of health information.

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**Keywords:** Privacy, Security, Health Information, Mobile Health.



## “Factors influencing the acceptance of mHealth apps for diet adherence”

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**Background:** Mobile health applications (mHealth apps) have enormous potential to support adherence to the diet. Despite the availability of mHealth apps, a significant proportion of users do not adhere to them. Therefore, understanding the factors influencing the acceptance mHealth apps and adherence to diet is the main issue in increasing the effectiveness of mHealth interventions.

**Objectives:** The objective of this study is to determine the factors influencing the acceptance of mHealth apps for diet adherence.

**Materials and Methods:** This cross-sectional study investigates the applicability of Davis' Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) in the acceptance of mHealth apps

for diet adherence. The sample size according to G-Power 3,1 was 147 diet<sup>s</sup> mHealth apps users. The questionnaire was distributed among them through a simple random sampling method. SPSS 20,0 and SmartPLS 3,0 were used for data analysis.

**Results:** The study's results indicated that the perceived usefulness ( $p = 0,01$ ) and perceived ease ( $p = 0,001$ ) had a significant positive effect on the attitude. Furthermore, behavioral intention on actual use had a significant positive effect. perceived usefulness was not associated with perceived ease ( $p = 0,132$ ). The attitude was not associated with behavioral intention ( $P = 0,112$ ). Security and trust had a moderating role in the relationship between behavioral intention and actual use of mHealth.

**Conclusion:** Findings provide important implications for design and development strategies to increase the acceptance and adherence to mHealth apps.

**Keywords:** Technology Acceptance, mHealth, Mobile Applications, Diet, Compliance.



## “Effect of Venous Thromboembolism Prophylaxis Recommender System on Adherence to Clinical Guideline among Surgical ICU Patients”

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**Background:** Despite major efforts to eliminate the large gap between the current clinical practice and evidence-based practice in the prevention of venous thromboembolism (VTE), adherence to VTE prophylaxis guidelines remains low.

**Objectives:** This study aimed to design, develop, and implement a VTE prophylaxis recommendation system and evaluate its effect on adherence to clinical guidelines for the intensive care unit (ICU)-admitted surgical patients in Southern Iran.

**Methods:** This cross-sectional study was conducted to assess the effect of a VTE prophylaxis recommendation system on adherence to clinical guidelines for the ICU-admitted surgical patients of Nemazee Hospital, Shiraz, Iran. The pre-intervention stage of data collection started from April 20, 2020 to August 22, 2020, and the post-intervention stage started from April 7, 2021 to July 9, 2021. The VTE risk in surgical patients was assessed using the Caprini risk assessment model. The patients' characteristics, VTE risk factors, contraindications for VTE prophylaxis, VTE prophylaxis prescription, and adherence to VTE prophylaxis guidelines were also investigated. All statistical analyses were performed in SPSS Version 24.

**Results:** Overall, 111 ICU-admitted surgical patients participated in this study. Adherence to VTE prophylaxis guidelines for surgical patients significantly increased from 33.9% to 50.9% from the pre-implementation stage to the post-implementation stage ( $P < 0.05$ ).

**Conclusion:** The results showed that our VTE prophylaxis recommendation system could improve adherence to VTE prophylaxis guidelines for the ICU-admitted surgical patients. However, further research is needed to evaluate the effect of VTE prophylaxis recommendation system on VTE and bleeding rates among surgical patients.

**Keywords:** Clinical Decision Support System, Venous Thromboembolism; recommender system; Intensive care unit.

## “Using decision tree technique to identify psychological predictors of online communications during COVID-19 in health-related systems”

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**Background:** Social media use and online engaging for sharing information during a health-related crisis are influenced by multiple factors. Use & gratification theory could be an appropriate framework to explain online behaviors for seeking or exchanging information and experiences regarding COVID-19.

**Objectives:** The current study is decided to investigate the crucial psychological predictors of online health-related communications among employees of Birjand University of Medical Sciences (9 cities in South Khorasan) during the COVID-19 pandemic.

**Materials and Methods:** This cross-sectional investigation was conducted with a descriptive-analytical approach. Data was gathered by a checklist. The authors

performed data analysis through SPSS<sup>19</sup>. The decision tree technique (Exhaustive chi-square automatic interaction detector (CHAID)) was used to identify the most critical factors associated with online health-related communications

**Results:** Out of the total, 406 data were entered for analysis. The participants' mean age was  $36.66 \pm 9.33$  years. Attitude was determined as the most critical factor. Participants using online media for interaction with professionals had the highest attitude score (Node 1;  $17.42 \pm 0.91$ ), and most online communications (Node 0;  $19.97 \pm 0.44$ ). Those intending to seek scientific content had moderate attitude scores toward media (Node 3;  $14 \pm 0.80$ ) and online communications (Node 6;  $10.10 \pm 0.68$ ). Finally, people with a negative attitude toward media (Node 2;  $9.89 \pm 0.68$ ) had poor online communications (Node 4;  $16.39 \pm 0.18$ ), and (Node 5;  $12.08 \pm 0.86$ ).

**Conclusion:** Based on the present study findings, trustworthiness of media and information effectiveness in meeting the health-related needs of individuals could help maintain online communications.

**Keywords:** COVID-19, Health Information Exchange, Online Social Networking

## “Investigating The Effect of Using Mobile Health in The Management of Gastrointestinal Diseases, A Systematic Review”

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**Background:** The use of digital health or e-health is growing. The use of mobile applications greatly improves patient care and creates new ways to collect data. Gastrointestinal diseases are one type of chronic disease that may benefit from these advances in digital health.

**Objectives:** The aim of this systematic review is to examine the articles conducted in the field of gastrointestinal diseases that used mobile health technology.

**Materials and Methods:** An electronic search was conducted in three databases including Scopus, PubMed and Web of Science. Search based on the two concepts of digestive diseases and the use of mHealth technology. The search time range was limited from 2000 to 2022, the inclusion criteria included articles that dealt with the management of gastrointestinal diseases with accompanying health tools, articles in English, and the exclusion criteria included non-English language articles, studies that were abstracted, letters to Editors and suggestions for future studies and

articles that do not recommend a specific tool or method. Finally, 8 articles were included in this systematic review.

**Results:** Of the 8 reviewed studies, 4 were randomized clinical trials, 3 were qualitative studies, and one was a retrospective cohort study, and the sample size of the studies varied from 15 to 333 participants. Diagnosing the recurrence and recovery of the disease, remote management of the disease, reducing the severity of disease symptoms, reducing outpatient visits and hospitalization are among the benefits of using companion health in the field of digestive diseases.

**Conclusion:** Based on the evidence, technology based on mobile health is a promising tool that can be effective for improving disease management and improving quality of life in patients with gastrointestinal diseases, and also with the changing landscape of virtual care due to the covid-19 pandemic. become an essential part of health care.

**Keywords:** Mobile Health, mHealth, Gastrointestinal Diseases

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## “Attitudes Toward The Use Of Information And Communication Technology (ICT) For Educational Purposes Among Medical Students: A Systematic Review of Cross-Sectional Studies”

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**Background:** Information and communication technology (ICT) is used as an integral part of education processes.

**Objectives:** This systematic review aimed to investigate the attitude towards the use of ICT for educational purposes among medical students.

**Materials and Methods:** Studies were retrieved from Embase, Web of Science, Scopus, PubMed databases on April 20, 2022. cross-sectional studies that examined medical students' attitudes and understanding of ICT for educational purposes were considered as inclusion criteria. In order to assessment the quality of the included studies, the Joanna Briggs Institute critical appraisal checklist for cross-sectional studies was used.

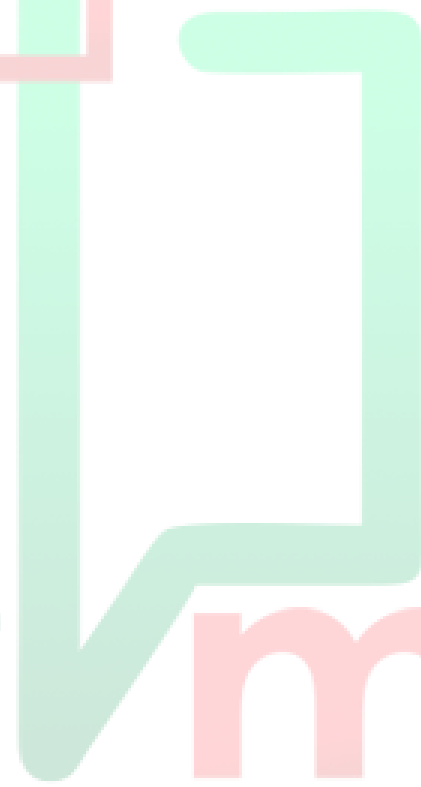
**Results:** In total, 14 articles met the inclusion criteria and were included in this review. All studies had the quality of inclusion in this review and no significant bias was observed. Of the 14 included studies, 10 (71%) showed that ICT experience and knowledge are influential for the adoption and adoption of an e-learning system

in the classroom. On the other hand, 9 (36%) studies reported the lack of necessary skills and training as the main obstacle to using ICT for educational purposes. Also, in two studies, the country's economic obstacles were stated as one of the basic problems of not using ICT for educational purposes.

**Conclusion:** The evidence from this systematic review showed that students have a positive attitude towards the use of ICT in educational purposes. However, the lack of skills and sufficient training is the main obstacle to its use.

**Keywords:** Information and communication technology, medical student, education, ICT

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## “Use of 'Virtual' Social Networks For Educational Purposes Among Medical Students During The Covid-۱۹ Pandemic: A Systematic Review of Cross-Sectional Studies”

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**Background:** The rapid spread of Covid-۱۹ is one of the biggest advantages of social media and its use in educational purposes

**Objectives:** This systematic review aimed to determine the use of social networks for educational purposes among medical students during the Covid-19 pandemic.

**Materials and Methods:** Studies were retrieved from Embase, Web of Science, Scopus, PubMed databases from December 29, 2019 to June 20, 2022. Cross-sectional studies that examined medical students' use of social networks for educational purposes were considered as inclusion criteria. In order to assess the quality of the included studies, the Joanna Briggs Institute critical appraisal checklist for cross-sectional studies was used.

**Results:** Of the 12 included studies, 9 studies (75%) of students stated that online learning has more advantages than the traditional test in terms of time and cost efficiency. They also stated that the use of social networks for educational purposes during the outbreak of Covid-19 has led to their academic progress and they found social media more interactive, easier and useful than other online educational platforms. However, two studies (17%) showed that students' use of social networks has caused them to drop academically and reduce their study hours per week.

**Conclusion:** The results of this systematic review indicate the popularity of social networks among medical students compared to other online educational platforms during the crisis of the Covid-19 pandemic. Such environments provide opportunities for policy makers, planners and educational administrators to make the best decision to control this global threat.

**Keywords:** Social media, medical student, education

## “Effect of Mobile Health Intervention in Patients with Ophthalmic Diseases: A Systematic Review of Clinical Trials”

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**Background:** Eye diseases are one of the main causes of vision loss in the elderly.

**Objectives:** This systematic review aimed to investigate the effect of telemedicine on the diagnosis, follow-up, monitoring, compliance and control of eye diseases.

**Materials and Methods:** A systematic review of controlled and randomized clinical trial studies without time limit was explored by searching keywords in the title, abstract and keywords of the studies in the reliable scientific databases Embase, Web of Science, Scopus, PubMed on April 20, 2022. A gray literature search was also conducted using the Google search engine to identify the most recent possible evidence. The quality of the studies was evaluated using the Joanna Briggs Institute (JBI) checklist; that the studies with a score above 7 were included in the analysis.

**Results:** A total of 40 articles were identified after removing duplicates. After screening the full text of the articles, 10 studies met the inclusion criteria. The technologies used for teleophthalmology in the studies included remote monitoring (20%), remote screening (40%), remote medical reminders (30%), and websites (10%). In (80%) of teleophthalmology studies, the intervention group reported a significant improvement in the investigated outcomes compared to the control group.

**Conclusion:** The results of our systematic review showed that in the majority of studies, Teleophthalmology interventions have a positive result compared to face-to-face interventions. Therefore, it seems that a well-designed teleophthalmology program can improve the patient's health by early diagnosis of the disease and identification of related risk factors.

**Keywords:** Teleophthalmology, teleoptometry, telemedicine, telerehabilitation

## “Students' Satisfaction of Teleconsultation During the Covid-19 Pandemic; A Systematic Review of Cross-Sectional Studies”

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**Background:** During the covid-19 pandemic, one of the areas that will be quickly affected is mental health.

**Objectives:** This systematic review aimed to investigate students' satisfaction of teleconsultation during the Covid-19 pandemic.

**Materials and Methods:** Studies were retrieved from Embase, Web of Science, Scopus, PubMed databases from December 29, 2019 to June 20, 2022. Cross-sectional studies that examined students' satisfaction of teleconsultation during the

Covid-19 pandemic were considered as inclusion criteria. In order to assessment the quality of the included studies, the Joanna Briggs Institute critical appraisal checklist for cross-sectional studies was used.

**Results:** 1 studies met the inclusion criteria. In all included studies, students are satisfied with distance counseling and find it convenient, useful, accessible and easy to use. Also, all 1 included studies and students' preference for confidentiality, time, cost and effectiveness in distance teleconsultation were not much different from face-to-face counseling. Furthermore, 2 included studies reported that teleconsultation was more useful and more satisfying than traditional counseling for residents of rural areas, people with limited mobility, people who avoid socializing, or those who are afraid of meeting new people.

**Conclusion:** The findings showed that patients are equally satisfied with face-to-face and teleconsultation if problems related to technology are minimized. On the other hand, some students are more willing to use teleconsultation for their mental health needs and find it useful due to the fear of negative views about psychological counseling. Therefore, future studies are suggested in order to identify the barriers and facilitators of teleconsultation services.

**Keywords:** Teleconsultation, remote consultation, student, satisfaction

## “Barriers and Facilitators of Using Mobile Health Applications from The Perspective of Information Security Among Medical Students: A Systematic Review of Cross-Sectional Studies”

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**Background:** Mobile health (mHealth) applications are poised to healthcare delivery, helping users take a more active role in managing their health in life.

**Objectives:** This review aimed to identify security barriers and facilitators of using mHealth applications from the point of view of medical students.

**Materials and Methods:** Studies were retrieved from Embase, Web of Science, Scopus, PubMed on August 14, 2022. Cross-sectional studies that examined the barriers and facilitators of using mHealth applications from the point of view of information security among medical students were considered as inclusion criteria. To assessment the quality of the included studies, the Joanna Briggs Institute critical appraisal checklist for cross-sectional studies was used.

**Results:** Of the 11 included studies, all studies, there were concerns about security and privacy for the adoption and acceptance of the use of health applications, the risk of information collected by the mobile device during transmission and storage, and also not being free. On the other hand, human and managerial challenges play a more fundamental and important role than technical challenges. Among the factors that are effective in the use of applications can be mentioned being younger, higher income, more education.

**Conclusion:** The results have shown the existence of security and privacy concerns among mobile app users, but there is considerable variation in privacy/health security attitudes for different demographic groups. Therefore, it is suggested that security features be customized for different users to address the individual concerns of users about the privacy and security of mHealth in applications.

**Keywords:** mHealth, mobile health, mobile apps



## “Trends in The Growth of Literature of Telepharmacy”

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**Background:** “Telepharmacy” means providing pharmaceutical services to patients through communication technologies. The limitations of the Internet and common pharmaceutical care methods have caused the invention of the telepharmacy concept. It has made significant achievements in patient telecare in rural areas, and improving patient adherence to pharmacotherapy regimens.

**Objectives:** Studying telepharmacy trend can be a valuable basis for determining future perspectives of this field. In this research, the bibliometric maps of telepharmacy studies and their prospects are reviewed and analyzed.

**Materials and Methods:** Considering AidiAhmi standards for bibliometric studies, TITLE-ABS-KEY("Telepharmacy"OR"Telepharmacy") search formula was used to extract Scopus-indexed studies (n=270). Using VOS viewer software, data checked with analysis types and units to report related quantitative and qualitative analyses.

**Results:** Our study showed that the first article in this field was published in 1998, and the number of articles increased suddenly after the Covid-19 pandemic. The most active author in this field has contributed to eight articles, with limited international collaborations. The most frequent keywords were "telepharmacy", "telehealth", "covid-19", "pharmaceutical care", "clinical pharmacy", and "rural".

The most cited articles were published in American journals. The USA and Spain were the most focused countries in this research, but Iran and Australia had only national research productions.

**Conclusion:** Telepharmacy is still a novel research topic and that international cooperation between authors needs more development. Iranian researchers need to pay special attention to telepharmacy as their main research field.

**Keywords:** Telehealth, Remote Consultation, mHealth, Telepharmacy, Bibliometric Analysis



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## “Assessing the impact of a smartphone-based pain management application on pain intensity and quality of life in adolescents with chronic pain: A mixed method study”

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**Background:** The development, implementation and qualitative evaluation of smartphone-based pain management applications may provide an opportunity for more optimal management of pediatric pain.

**Objectives:** To assess a smartphone-based pain management application regarding the feasibility, adherence, participant satisfaction and effectiveness on pain intensity and quality of life in adolescents with chronic pain.

**Materials and Methods:** The study was carried out in the quantitative and qualitative stages using a mixed method approach. The quantitative stage included 128 adolescents who had chronic pain. The intervention group received a pain management program through a smartphone-based application. The adolescents were assessed regarding pain intensity and different dimensions of quality of life at three phases. The findings in the quantitative stage were explained by qualitative interviews.

**Results:** The findings of the quantitative stage showed significant improvements in pain intensity, emotional, social and school functioning, but not in physical functioning of the adolescents. A high level of adherence (98,1%) and satisfaction (96,8±6,8) with the smartphone-based pain management program was found.

Based on the qualitative interviews, adolescents' pain management strategies can be categorized in three main categories: physical management, psychological management, and interpersonal resources.

**Conclusion:** The results confirm the positive effect of a smartphone-based pain management program on the pain intensity and different dimensions of quality of life of adolescents with chronic pain. A mobile application incorporating both the psychological and physical management of pain may be able to help adolescents with chronic pain to reduce the negative impacts of pain on their life.

**Keywords:** Pain, Adolescent, Quality of Life, Mixed method study

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## “Comparing the effects of multimedia and face-to-face pain management education on pain intensity and pain catastrophizing among patients with chronic low back pain: a randomized clinical trial”

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**Background:** Low back pain (LBP) is a very common problem among different age groups.

**Objectives:** The present study aimed to compare the effects of multimedia and FTF pain management education (PME) on pain intensity and pain catastrophizing (PC) among patients with chronic LBP.

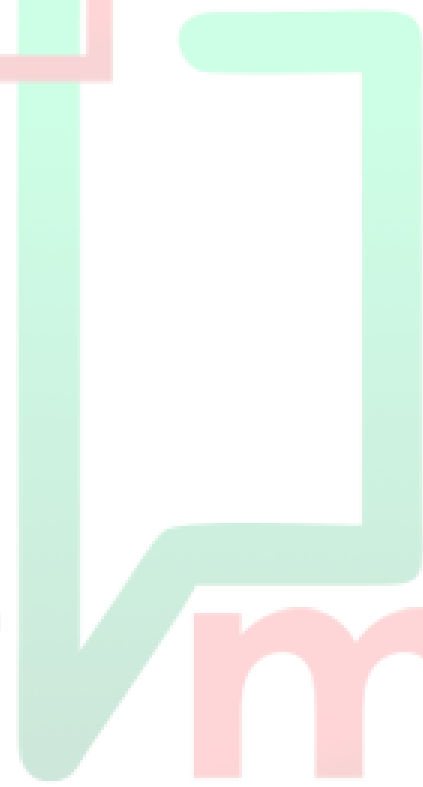
**Materials and Methods:** This single-blind randomized controlled clinical trial was conducted on ninety patients with chronic LBP selected from three healthcare centers affiliated to FUMS. Participants were randomly allocated to a multimedia, an FTF, and a control group. Participants in the multimedia PME group received PME through watching seven educational CDs and their counterparts in the FTF PME group received the same educations in seven weekly FTF educational sessions. Data were collected before, immediately after, and one month after the study intervention. To analyze treatment effects, MANOVA with Tukey post hoc test was performed. Effect size was reported where appropriate. Clinical outcomes (Minimal Detectable Change (MDC)) for pain intensity also reported.

**Results:** The results indicated that the two interventions exerted significant statistical effects on decreasing the participants' pain intensity and catastrophizing compared to the control group. The findings indicated non-significant main effect of time and non-significant difference between groups for mean differences of immediately and one month after intervention for intensity and PC scores. The MDC for pain intensity also showed no significant clinical difference.

**Conclusion:** Both multimedia and FTF PME are effective in significantly reducing pain intensity and PC among patients with chronic LBP. Therefore, PME through multimedia and FTF is recommended for chronic LBP management.

**Keywords:** Pain management, multimedia, pain catastrophizing

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## “Effect of Mobile Health Intervention in Gastrointestinal Diseases: Systematic Review”

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**Background:** Gastrointestinal diseases are associated with significant health care costs.

**Objectives:** This systematic review aimed to evaluate the effect of mobile health (mHealth) intervention in improving the disease activity, Quality of Life (QoL), privacy and security measures for the management of gastrointestinal diseases.

**Materials and Methods:** We conducted a systematic search on the PubMed, Embase, Scopus, and Web of Science databases on July 12, 2022. This study was conducted by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) to report evidence from studies included in this systematic review. We included randomized controlled trials (RCTs) that used mHealth interventions for the management of gastrointestinal diseases.

**Results:** 30 articles with 4 topics of patient satisfaction (n=12), disease activity (n=10), quality of life (n=14) and privacy were included in this review. Studies focused on digestive diseases including inflammatory bowel disease, ulcerative colitis, colon disease, irritable bowel syndrome. The results showed that data transmission security was guaranteed by only 0 mHealth interventions. Patient satisfaction was between 20,7-100% and 74-100%, respectively. Disease activity, as measured by symptom severity scales and physiological biomarkers, showed improvements following mHealth interventions in several, but not all, studies. of the 0 included studies showed significant improvements in QoL and improvements in disease following mHealth interventions in some studies.

**Conclusion:** Data security and evidence of effectiveness are still available in a small number of mHealth interventions, the overall quality of mHealth interventions was moderate and may be effective in managing disease activity and improving QoL in gastrointestinal diseases.

**Keywords:** mHealth, mobile health, gastrointestinal diseases



## “Chatbots for the management of mental and behavioral disorders: a systematic review”

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**Background:** Chatbots are capable of conversing with users and have the potential to improve the mental health of people who are reluctant to seek therapist advice. Despite the studies, there is a need to collect them regularly so that users are familiar with their applications. Therefore, this study was conducted with the aim of investigating the use of chatbots to manage mental and behavioral disorders in 2022.

**Methods:** This study was conducted based on PRISMA guidelines. PubMed, Scopus and Web of Science databases were searched from 2016 to 16 October

2022 to identify English studies related to the objective. The included studies were assessed for quality and risk of bias using the STROBE checklist by two authors. Non-English, non-original studies and studies that were not related to the purpose were excluded.

**Results:** Of 2200 retrieved articles, 10 articles met the inclusion criteria. The use of chatbots for mental health included screening, diagnosis and treatment. These tools were used to regulate emotions, manage academic or pregnancy stress, increase concentration, adaptive coping strategies, and self-disclosure.

**Conclusion:** There are several mental health chatbots that therapists should be familiar with their applications so that they can help patients in choosing the most suitable chatbot. More studies are needed on the effectiveness and acceptability of chatbots.

**Keywords:** Chatbot, conversation agents, mental and behavioral disorders, mental health.

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## “Adopting Mobile Health Application in Healthcare by Nurses”

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**Background:** Mobile applications are among effective learning tools and have a significant role in transferring information and knowledge to nurses.

**Objectives:** The current study was carried to identify the factors affecting nurses' use of practical health related mobile applications in education and patient interaction based on the combined Technology Acceptance Model (TAM) and Diffusion of Innovation (DOI).

**Materials and Methods:** The study is a descriptive-analytical study with a cross-sectional method. The research population includes nurses working at Tabriz University of Medical Sciences hospitals, 100 of which were selected as the research sample using simple and available sampling. The data collection instrument was a questionnaire, the validity and reliability of which were confirmed ( $\alpha=0.9$ ). Data analysis was carried out using a correlation test and regression analysis by applying SPSS v16 software.

**Results:** The findings show that perceived usefulness and perceived ease of use have a direct and significant effect on the rate of using mobile applications by nurses ( $P\text{-value} \leq 0.05$ ), ( $\beta = 0.02$ ), ( $\beta = 0.15$ ). Other findings indicate that relative advantage, compatibility, trialability and observability, have a direct and significant effect on nurses' use of mobile applications, while complicatedness does not have a significant effect.

**Conclusion:** The current study identifies the effective factors in nurses' use of health-related mobile applications based on an integrated model of TAM and DOI. Designers of mobile applications should consider these factors in designing and developing programs so that mobile applications can successfully fulfill their purpose in healthcare.

**Keywords:** Mobile Applications, Nursing Informatics, Technology Acceptance Model (TAM), Diffusion of Innovations (DOI), Nurses

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## “The effect of mobile health on the prevention and detection of post-transplant skin cancer: A systematic review”

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**Background:** In transplant recipients, due to the taking immunosuppressants, a wave of post-transplant malignancies is observed and among non-lymphoid malignancies, skin cancers are common. Mobile health(mHealth) as an emerging technology has numerous capabilities such as teledermoscopy which may be effective in this field.

**Objectives:** In this article, in order to find a suitable solution to reduce the incidence of post-transplantation skin cancer(PTSC), we reviewed the available articles in this field and studied mHealth as an emerging intervention.

**Materials and Methods:** In this systematic review, keywords: (Skin cancer and its synonyms such as skin neoplasm[MeSH]), Transplantation[MeSH], (Mobile health and relevant words such as Telemedicine[MeSH]) were searched in PubMed, Google scholar, Scopus and Web of Science databases by 2 medical students. English language articles related to intervention of mHealth in PTSC were included in the study. This study was based on the PRISMA guidelines and the quality assessment of the articles was done by CASP checklists.

**Results:** In this systematic review, 532 studies were identified through keyword search. After applying inclusion and exclusion criteria, 8 studies were included in this review. Intervention modalities were text messaging (2), sun protection programs (3), educational video (1) and teledermatology (2) which demonstrated that mobile health can be effective in different ways.

**Conclusion:** The outcomes of this review could provide primary evidence related to the effectiveness of mHealth and teledermatology for diagnosis, follow-up and prevention of PTSC. To make better comment in this regard, further studies with rigorous methodology, high level evidence quality, and long-term follow-ups are required.

**Keywords:** Telemedicine, Mobile health, Teledermatology, Skin neoplasm, Transplantation.

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## “The effect of mobile health on the prevention and detection of post-transplant skin cancer: A systematic review”

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**Background:** In transplant recipients, due to the taking immunosuppressants, a wave of post-transplant malignancies is observed and among non-lymphoid malignancies, skin cancers are common. Mobile health(mHealth) as an emerging technology has numerous capabilities such as teledermoscopy which may be effective in this field.

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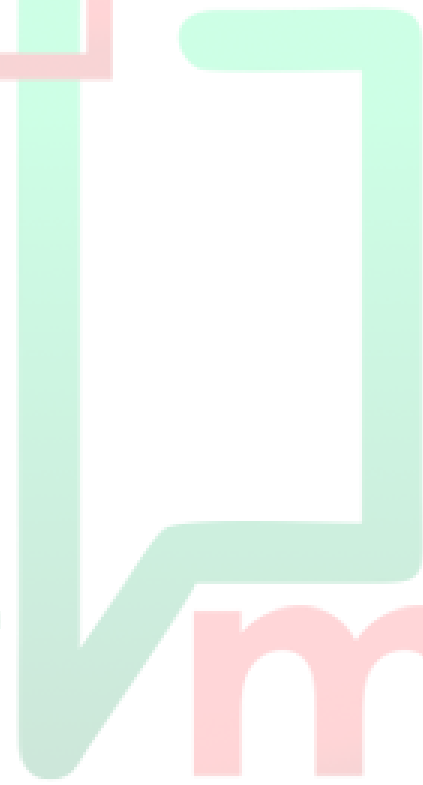
**Results:** In this systematic review, 92 studies were identified through keyword search. After applying inclusion and exclusion criteria, 12 studies were included in this review. Intervention modalities were text messaging(2), sun protection

programs(۳), educational video(۱)and tele dermatology (۳)which demonstrated that mobile health can be effective in different ways.

**Conclusion:** The outcomes of this review could provide primary evidence related to the effectiveness of mHealth and tele dermatology for diagnosis, follow-up and prevention of PTSC. To make better comment in this regard, further studies with rigorous methodology, high level evidence quality, and long-term follow-ups are required.

**Keywords:** Telemedicine, Mobile health, Tele dermatology, Skin neoplasm, Transplantation.

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## “Explaining the Challenges of Electronic Prescription: A Phenomenological Study”

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**Background:** Electronic prescription is designed to complete the implementation of electronic health records, with the aim of increasing patient safety and improving the quality of hospital services, due to the interdisciplinary nature of this system and its numerous stakeholders, the implementation process is implemented with There are many complexities.

**Objectives:** this study was conducted to explain the challenges of copywriting and electronic screwing.

**Materials and Methods:** The present qualitative study was performed by phenomenological method in 2022-2023. The study data were collected through semi-structured interviews with 25 key people in the field of treatment, staff and hospitals of Tehran University of Medical Sciences and analyzed through MAXQDA\_10 software

**Results:** Challenges of implementing this program were categorized in 4 main themes and 8 sub-themes: policy preparation (policy secretariat formation, consensus building), policy formulation (formulation of policy content and policy advocacy), policy implementation (policy planning, policy execution) And policy evaluation (policy monitoring and policy evaluation).

**Conclusion:** Develop integrated executive guidelines for existing challenges, educate and inform stakeholders, strengthen Internet infrastructure, progress intra-sectoral and cross-sectoral coordination, correct deficiencies related to service coding and update them, confidentiality of health data and the determination of the level of access to information and the participation of the private sector and its connection to the health data center are suggestions that can be helpful in solving the existing challenges..

**Keywords:** Electronic Prescription and Scripting, Electronic Health Record, Patient Safety, Challenges, Qualitative Study

## “The Role of Mobile Health in Facilitating Self-care in Organ Transplant Patients”

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**Background:** Medical management for patients with organ transplantation at home after transplant is important for recovery and transition to daily life.

**Objectives:** this study was conducted with the aim of investigating the role of health software in facilitating self-care in patients with organ transplantation.

**Materials and Methods:** A comprehensive investigation was performed on MEDLINE (via Pub Med) and EMBASE (via Scopus) in October ٢٠٢٢. The criteria for inclusion in the study were original articles and executive implementation, all English papers included" The use of m-Health apps for self-management after transplantation "and the criteria for exclusion were short articles. The articles were integrated based on category of outcomes, characteristics of interventions, and their impact. articles were extracted using related scientific keywords, "Mobile Health", "Smartphone", "Mobile Apps", "Mobile Health Management" Service", "Mobile Applications", "Self-care",

"Patient Self-Management", "Organ Transplantation", After removal of duplicate the content was classified and analyzed using methods Scientifically done.

**Results:** A total of 133 articles were retrieved and sixteen publications were included for full-text analysis. Interventions include those involving the follow-up of medication and treatment processes (3 studies), attitudes of patients (6 studies), remote monitoring (3 studies), patient education (4 studies), improving care and reducing healthcare costs (1 study). In 6 (50%) out of 12 outcomes, improving self-care in patients with organs transplantation and increase motivational abilities and improving drug adherence and 2 (20%) and patient education.

**Conclusion:** Smartphone's based on mobile app technology can increase the possibility of quick access to information by connecting patients to health care, facilitating remote care providers and reducing costs at any point and any time.

**Keywords:** Organ Transplantation, Mobile Health, Self-Management, Smartphone.

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## “Using Mobile health for self-care in Patients with Bulimia”

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**Background:** The Application of technologies for eating disorders (EDS) can help to improve access to care and recovering an (EDS) and holds novel Features such as meal reminders, affirmations, and allowing clinicians to monitor patients' data.

**Objectives:** Mobile health emerged to fill gaps in service delivery and Demonstrated promise in treating (EDS).

**Materials and Methods:** A comprehensive investigation was performed in MEDLINE (via Pub Med) and EMBASE (via Scopus) for searching papers in November 2022. All English papers were included. After reviewing, the titles and abstracts that using scientific keywords as "Mobile health", " Mobile Apps", " Mobile health management service", "bulimia", "Patient self- Management", and "eating disorder" were selected. After the removal of duplicate content, the remaining papers were classified and analyzed.

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**Results:** Finally, we found 47 articles and after screening them, 17 articles were examined for full-text analysis. Interventions include those involving self-help behavioral therapy in EDS with telemedicine (changes in body weight and eating behaviors) (7 studies), self-help remote monitoring (changes in Body Mass Index, physical activity as indexed by the number of steps per day) (2 studies), using the phone for treatment (7 studies), using guided self-help intervention (1 study). In 7 (41%) out of 17 outcomes, Improving self-care in a patient's with EDS and helping to increase motivational abilities, and in 2 (12%) Improving maladaptive eating behaviors.

**Conclusion:** mobile health was more effective for individuals with (EDS), and improving quality of life and cost-effective treatment represents a new way to provide accessible service in a convenient and time-efficient way.

**Keywords:** Bulimia, mobile health, Eating disorder, self-care.

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## “A Review on the Latest Researches Focusing on Diagnosing the Cognitive Disorders (CDs) based on medical images”

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**Background:** Nowadays, population aging has become an important issue in the world. Aging causes many diseases in elderly people. One of these diseases is cognitive disease. Early diagnosis of these types of diseases, in addition to helping doctors and specialists in preventing the progression of the disease and treating it, leads to an increase in the quality of life and longer survival of people.

**Objectives:** The purpose of this study is to review previous studies in the field of medical image processing based on machine learning algorithms for early diagnosis of cognitive diseases, which is one of the technologies that will affect the future of smart healthcare.

**Materials and Methods:** This review study categorizes the previous papers in terms of their considered dataset, preprocessing tasks, data representation methods, models, and classifiers.

**Results:** Reviewing previous studies found that most articles used ADNI and OASIS database data due to easy access to healthy and diseased classes. MRI and fMRI images were the most used in the articles. In the reviewed articles, the SVM

model was used the most to classify patients and healthy people and achieved high accuracy.

**Conclusion:** Early diagnosis of cognitive diseases is critical. By expanding technology in the field of health and developing portable and accessible software based on mobile phones, doctors can be helped with better diagnosis and steps can be taken to improve the quality of life of the elderly and their caregivers.

**Keywords:** Neuroscience, Data-driven analytics, Brain, Computer-aided diagnosis



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## “Remote monitoring system to support PAP therapy in patients with obstructive sleep apnea: a multi-center randomized controlled trial”

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**Background:** in patients afflicted with mild to severe obstructive apnea, the best treatment is the continuous positive airway pressure (CPAP) device.

**Objectives:** to develop and evaluate an intervention tailored to patients' needs to increase the rate of CPAP adherence in patients afflicted with OSA, who undergo PAP therapy.

**Materials and Methods:** A multi-center, 3 parallel-arm, randomized, controlled trial was conducted. Participants with OSA who undergo PAP therapy were randomized to one of three groups: control arm (usual care), educational booklet arm, and mobile-based application arm. CPAP usage, the percentage of days using the device for more than 4 hours, change in knowledge, risk perception, outcome expectancy, self-efficacy, and ESS were assessed before and one month after interventions in the three groups.

**Results:** The result showed the change in average CPAP usage, knowledge, risk perception, and self-efficacy in the application group was significantly higher than

the control and booklet groups. Also, the change in use for more than ۴ hours in the application group was significantly higher than the control group.

**Conclusion:** The study results indicated that the improvement of primary and secondary outcomes in adherence to CPAP was significantly higher in the application group than in other study groups. Given the increasingly penetrating influence of smartphone-based technologies, it seems that mobile-based applications could potentially be adopted in the population of patients with OSA.

**Keywords:** Continuous positive airway pressure, obstructive sleep apnea, patient adherence, patient education, mobile health

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## “Design and evaluation of interactive binocular game for amblyopia treatment: a study protocol for a randomized controlled trial”

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**Background:** Amblyopia, as a neurodevelopmental preventable visual disorder, affects approximately 1.1 % in Asia. A binocular approach to treating amblyopia has been recently proposed. Whether the binocular playing game treatment is comparable to patching treatment needs further randomized clinical trials.

**Objectives:** To design, develop, and evaluate a new binocular game to treat amblyopia.

**Materials and Methods:** This study has been designed as a non-inferiority, randomized, two parallel-group, controlled trial. Forty-four patients between 4 and 12 years diagnosed with amblyopia will be randomly assigned to the control and intervention groups. In the intervention group, amblyopia treatment is provided with red-green anaglyphic glasses and a red filter placed in front of the amblyopic eye, along with a game to be played for 30 minutes twice a day. Those in the control group will receive patch therapy according to amblyopia treatment study protocol.

The primary outcome is to change visual acuity in the amblyopic eye from the baseline to 3 months after randomization.

**Results:** The recruitment of participants has recently been completed. The pivot game is potentially useful to improve amblyopic-eye visual acuity outcomes.

**Conclusion:** The interactive binocular game has the potential to reduce the psychological pressure on families to patch their children's amblyopic eye or may promote further compliance to the treatment or possibly associates with better binocular function outcomes. If the results are favorable, children's habits and interest in video games can be possibly used for healthcare purposes.

**Keywords:** Amblyopia, Patch therapy, Serious game, Binocularity, Mobile health

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## “A review of the role of mobile health during the Covid-19 pandemia”

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**Background:** In March 2020, the World Health Organization declared the 2019 coronavirus disease a pandemic. It did not take long that the health system of all countries faced a serious crisis.

**Objectives:** The purpose of this article is to investigate the role of M-health and its application in prevention, diagnosis, and treatment during the spread of Corona.

**Materials and Methods:** This research is a systematic review article based on library studies and internet searches in reliable databases such as PubMed, Science Direct, Springer, SID, Magiran, Civilica, and advanced searches in Google and Google Scholar. The initial search yielded 2000 papers from PubMed and Google scholar. A total number of 1300 studies were remained after removing duplicates. Finally, 20 studies were included in the final review.

**Results:** The results of 20 studies showed that mobile health can play an effective role in the prevention, diagnosis, and treatment of the covid-19 pandemic. The key benefits of using mobile technology include increased awareness, improved assistance in tracing and testing suspected coronavirus patients, improved

assistance in searching for and scheduling health information and medical appointments and improved overall productivity, and quality of Life.

**Conclusion:** Using mobile health can help manage the crisis and the dangerous effects of the outbreak and minimize the damages. Strategic planning for implementing mobile health technology can improve the public health response to outbreaks, reduce economic losses, and save lives.

**Keywords:** Telemedicine, Mobile Health, COVID-19, SARS-CoV-2



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## “The effects of mobile health on self-management in patients with gastric cancer: A systematic review”

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**Background:** Cancer is one of the leading causes of death and disability around the world. Gastric cancer is the fourth leading cancer worldwide and the second leading cause of cancer-related mortality. There are many innovative ways and methods of using digital technology to monitor and treat cancer. Mobile health is one of these innovations. Mobile health platforms are progressively utilized for monitoring cancer patients in medical subjects.

**Objectives:** Due to the importance of self-management for patients with gastric cancer, the role of mobile applications in facilitating education and management has become more significant. This study aimed to identify the opportunities of mobile health to self-management in patients with gastric cancer and help them improve disease management.

**Materials and Methods:** Systematic literature searches were conducted between January ۲۵, ۲۰۲۱ and December ۷, ۲۰۲۲, through PubMed, Web of Science

databases, and Google Scholar search engine. The keywords were Gastric cancer, stomach neoplasm, m-Health, mobile app and health app. From the 1,002 abstracts retrieved, 141 articles were selected for full-text review, and 10 papers were related to the subject.

**Results:** M-health positively impacted gastric cancer patients to improve self-management. According to the researches, these variables were studied: morbidity, mortality, hospitalization rates, lifestyle changes, the process of care improvements, clinical outcomes and costs.

**Conclusion:** With the development of mobile-based technologies, many studies demonstrate that mobile health has a great effect on self-management in patients with gastric cancer. Patients can benefit from this new technology support and restore the critical decline in physical and medical functions.

**Keywords:** Gastric cancer, stomach neoplasm, m-Health

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## “English Mobile Applications for Gastroesophageal reflux disease: A Quality Assessment”

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**Background:** Gastroesophageal reflux disease (GERD) is a common clinical issue affecting millions worldwide. The rapid growth in the number of mobile health applications could have profound significance in the prevention of disease or the treatment of patients with chronic diseases such as GERD.

**Objectives:** This study aimed to assess the mobile application for Gastroesophageal reflux disease, providing general and specific rating scores for each aspect of MARS.

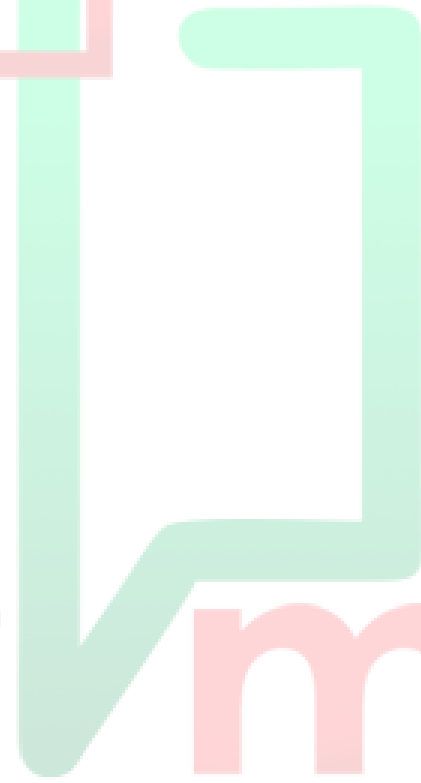
**Materials and Methods:** We examine the existing apps on two leading mobile app stores: Google Play and the IOS, in Oct-2022 for apps related to GERD. Eligibility criteria include: capable of running on Android or IOS operating systems, in the English language, especially for GERD, and being available in Iran and free. After removing duplicates, the apps were reviewed, rated, and evaluated independently by two reviewers with Mobile App Rating Scale (MARS) tools.

**Results:** Regarding app quality, the maximum score belonged to GERDhelp (8.8/9). We found that most apps attempted to provide these features via features such as tracking diet and mood, sharing information with the caregiver, and visual aid, but none were able to provide all the features.

**Conclusion:** Most applications aim to reduce or eliminate disease symptoms by a specific diet, change lifestyle, and solve gastric and gut issues. Despite the large number of people with GERD, there are no adequate mobile apps to aid patients with GERD. It appears necessary to develop a series of high-quality apps in all categories because none of them could provide all the features.

**Keywords:** mobile health. Mobile application, GERD

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## “Mobile Dental Services and Oral Health in the Elderly”

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**Background:** Today, oral and dental health has received the attention of countries due to its closer relationship with public health. Mobile dental services are one of the care approaches that are very useful today.

**Objectives:** The use of mobile dental services is beneficial for the elderly; therefore, this study was conducted with the aim of investigating mobile dental services for the elderly by reviewing previous studies.

**Materials and Methods:** This review study was conducted in Pubmed, scholar and science direct databases from 2017 to 2022, 23 articles were received and 12 articles were reviewed. Unavailable articles and preprints were excluded from the study.

**Results:** Some of the mobile dental services for the elderly include the use of intraoral cameras to perform oral examinations (photos from inside the mouth and live videos for diagnostic decisions), a proper schedule for face-to-face treatment if needed, and providing necessary training. In Iran and some countries such as Austria and the countries of the African continent, mobile dental was used very little. Surveys showed that most of the elderly people had a positive opinion about these services, and about half of them had used these services at home and often in sanatoriums after training. Some elderly people may not use these services properly

due to their low level of health literacy,impaired mental and functional abilities,living in deprived areas,lack of access to the Internet.

**Conclusion:** M.dental services have a useful role in the quick diagnosis of oral cavity problems,increasing the level of awareness of the elderly for self-care,improving the state of quality of life,reducing costs.Surveys show that more efforts are needed to develop up-to-date guidelines for m-dental services.

**Keywords:** Mobile dental,Mobile health,the elderly



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## “Mobile Health Services and Diabetes Management”

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**Background:** Due to the chronic nature of diabetes, these patients need continuous follow-up. Due to the development of new technologies, the use of mobile phones to develop and access health information in these patients has been considered.

**Objectives:** The current review study was conducted with the aim of mobile health services and management of diabetes.

**Materials and Methods:** This review study was conducted in Pubmed, scholar and science direct databases from 2017 to 2022, 28 articles were received and 14 articles were reviewed. Unavailable articles and preprints were excluded from the study.

**Results:** Investigations in patients with type 1, 2 diabetes and gestational diabetes have shown that the use of m-health can help to increase self-efficacy, self-management and remote monitoring of patients through electronic health records, in better management of diabetes and control of the resulting complications, especially in young people who are more familiar with technology, and prove its effectiveness by reducing acute hypoglycemic and hyperglycemic attacks, reducing HbA<sub>1c</sub> and reducing hospitalization.

**Conclusion:** Although the use of m-Health can be cost-effective and consistent with social changes. However, considering that the clinical findings about the effectiveness of m-health in disease control are limited, especially in Iran, therefore its acceptance by the treatment staff and economic support is low. Therefore, it is

necessary to carry out detailed clinical studies, culturalization and development of investment in this field in Iran.

**Keywords:** mobile health, health services, Diabet Management



## “Investigating the Impact of M-health on the Mental Health of the Older Adults during the Covid-19 Pandemic”

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**Background:** Considering the vulnerability of the elderly during the corona virus epidemic, the psychological effects of the conflict with the corona virus for the elderly and people with underlying diseases who are known to be more vulnerable, so the corona virus pandemic is a serious threat to the mental health of the elderly.

**Objectives:** Investigating the impact of m-health on the mental health of the older adults during the Covid-19 pandemic.

**Materials and Methods:** The current research is a clinical trial using a pre-test and post-test design. The participants of this study were elderly referring to comprehensive health centers in Shiraz. 90 elderly people who met the inclusion criteria selected. The duration of the m-health training interventions was two months. Data collection tools were stress-anxiety-depression questionnaire (DASS21), sleep quality of Pittsburgh. Data analysis was done using SPSS20 software.

**Results:** The average age of the participants was  $66.07 \pm 3.28$ , half of the participants were female and the other half were male. 86% were married, 70% had high school education or less. The average scores of stress, anxiety, depression, sleep quality before and after the intervention were,  $18.33 \pm 2.0$ ,  $15.53 \pm 3.59$ ,  $15.20 \pm 3.83$  and  $10.13 \pm 3.18$ ,  $10.13 \pm 3.18$ ,  $13.23 \pm 2.28$  respectively. The findings showed that training through m-health can significantly reduce the level of stress and anxiety, also the quality of sleep has improved significantly.

**Conclusion:** Education through m-health can play an important role in improving or maintaining the mental health of the elderly.

**Keywords:** Impact, M-health, Mental Health, Older Adults, Covid-19 Pandemic.



## “The prediction of mental health of older adults with multimorbidity during the covid-19 epidemic”

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**Background:** The covid-19 epidemic and quarantine, have various effects on the mental health of people, especially vulnerable people such as older adults. These effects may be aggravated in older adults who have one or more chronic diseases.

**Objectives:** The investigation of the mental health of older adults with several chronic diseases during the covid-19 epidemic.

**Materials and Methods:** This is descriptive-analytical research that was conducted cross-sectionally on older adults, who were referred to comprehensive health centers in Shiraz. During this research, 90 older adult people who met the criteria for entering the study were examined by demographic information, Depression

Anxiety and Stress Scale 21 (DASS-21), and the Petersburg sleep quality. Data analysis was done using SPSS-20 software.

**Results:** 92.2% (47 people) of the participants were between 60 and 70 years old. All participants were suffering from at least 2 types of chronic diseases at the same time and 90% of them were taking at least one type of medicine. 80% (40 people) of the participants were female, 76.7% (39 people) were married, and 82.2% (41 people) were less than a diploma. 20% (10 people) of the participants lived alone. There was a positive and significant relationship between multimorbidity and sleep disorders ( $p < .001$ ,  $r = .374$ ), and depression ( $p = .042$ ,  $r = .210$ ). However, no significant relationship was found between multimorbidity and stress and anxiety ( $p > .05$ ).

**Conclusion:** During crises such as the Covid-19 epidemic, older adults, especially older adults with chronic diseases, need psychological and social support in addition to physical care.

**Keywords:** Covid-19, multimorbidity, elderly, mental health, sleep disorder

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## “The Impact of Using Technology m-Health on the Mental Health of the Older Adults in COVID-۱۹ pandemic”

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**Background:** The Covid-۱۹ pandemic caused fear, insecurity and general anxiety among many people of the world, especially the older adults, which resulted in a decrease in people's mental health. Mental health is recognized as a requirement at the global health level, and on the other hand, mental disorders are one of the most important causes of disability around the world. Currently, there are many approaches in the world in order to improve mental health, one of these approaches is the use of m-Health technology.

**Objectives:** Due to the increasing importance of m-Health, therefore, the present study was prepared with the aim of investigating the impact of m-Health on the mental health of the elderly during the COVID-۱۹ epidemic.

**Materials and Methods:** Databases have been Direct Science, PubMed, Scopus, and Google Scholar. The main keywords were “Mobile Health”, “Mental Health”,

“Older Adults” and “COVID-19” that were searched in the published papers during 2019-2022. 127 articles were found, at the end of the screening stage, 9 articles were analyzed

**Results:** Mobile health technology can be effective in improving the mental health of the elderly, mobile health can lead to increase mental capacity, empowerment, autonomy and reduce fear of getting corona disease, social isolation, anxiety, stress, depression, loneliness.

**Conclusion:** The use of m-health technology can be effective in improving the mental health of the elderly, so teaching and promoting the use of this type of technology can have a positive effect on improving the mental well-being and quality of life of the elderly.

**Keywords:** m-Health, Mental Health, Older Adults, COVID-19.

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## “The Role of Mass Media in the Happiness of Older Adults Women during the Corona Pandemic”

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**Background:** Corona pandemic, Quarantine and social distancing led to increased stress, anxiety, reduced communication and social support, and created the basis for the occurrence of mental health disorders. Following the increase mental health disorders, happiness in the elderly has significantly decreased.

**Objectives:** investigating the role of mass media on the happiness of elderly women during the corona pandemic.

**Materials and Methods:** The present descriptive-analytical study conducted in Shiraz city in 2019. The participants of the study included elderly women living in

Shiraz city, who were randomly selected from among the elderly referred by comprehensive health service centers in Shiraz city. The data was collected in the form of face-to-face interviews using a demographic questionnaire and the Oxford Happiness Questionnaire.

**Results:** In this study, 373 elderly women with an average age of  $73.67 \pm 7.01$  participated. According to the results of the independent t-test, the average score of happiness in the elderly who used mass media was significantly lower than that of the elderly who did not use mass media ( $45.85 \pm 3.38$  compared to  $46.32 \pm 3.38$ ).  $20, p > 0.01$ ).

**Conclusion:** At the beginning of the Corona pandemic, the national mass media started promoting negative stereotypes such as "the elderly are the only victims of the Corona", and this type of advertising led to an increase in fear and anxiety among the elderly, followed by a decrease in their happiness. For this reason, in order to maintain mental health during the corona pandemic, the elderly tried to use social media less.

**Keywords:** Social media, Happiness, Older Adults, Corona Pandemic.

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## “Loneliness and the Use of Mass media among the Older Adults with Multimorbidity in the Corona Pandemic”

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**Background:** Consequences of loneliness in the elderly with multimorbidity are doubled. In order to control and manage the unpleasant consequences of loneliness, therefore seniors are more desire to use social media.

**Objectives:** Investigating the effect of loneliness and the use of mass media among the elderly with multimorbidity in the corona pandemic.

**Materials and Methods:** The present descriptive-analytical study conducted in the elderly living in Shiraz city in 2019. The data collected in the form of a face-to-face interview using a demographic questionnaire and the 11-question

Gierveld Loneliness Questionnaire. Data analyzed by independent t-tests and Spearman and Pearson correlation in SPSS version 20 software.

**Results:** In this study, 100 elderly people with an average age of  $78,13 \pm 6,08$  participated. According to the independent t-test, the average loneliness in elderly women was significantly higher compared to elderly men ( $7,66 \pm 2,67$  compared to  $5,96 \pm 2,92$ ,  $p < 0,001$ ). In addition, based on the correlation test, loneliness has a significant and inverse correlation with perceived health ( $r = -0,24$ ,  $p < 0,001$ ) and the amount of use of social media ( $r = -0,24$ ,  $p < 0,001$ ).  $>p$ ), use of social media also had a significant direct relationship with perceived health ( $r = 0,26$ ,  $p < 0,001$ ).

**Conclusion:** Corona disease, quarantine, social distancing has led to a decrease in communication with others, social relations, increase social isolation and loneliness. In order to compensate for the gap created in their communication, the elderly increased their desire to use social media, in fact, they have been looking for a way to maintain their social connections.

**Keywords:** Loneliness, Mass media, Older Adults, Multimorbidity, Corona Pandemic

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## “Studying the Effect of Using an Educational Booklet Based on Augmented Reality Technology on the Lab Skills of Pharmacy Students”

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**Background:** One of the most challenges in electronic learning (e-learning) is practical lab courses. The widespread use of smart phone devices, as well as the access to internet networks, have made augmented reality (AR) increasingly popular in educational systems in recent years.

**Objectives:** This study investigated the effect of using augmented reality on the learning and lab-skills of pharmacy students.

**Materials and Methods:** The traditional booklet of the course was revised and the experiments videos were added to the booklet using AR technology. Around 80 students were randomly divided into two intervention and control groups with almost equal numbers. Learning and practical skills of the students was assessed.

**Results:** The mean of scores, from 3 points, in pre-test of control and intervention groups were 2.3 and 2.56, respectively, and in post-test were 1.97 and 1.73, respectively. The mean score of lab skills for control and intervention groups were 4 and 4.6 from 5 points, respectively. There was no significant difference between

two groups on the pre- and post-test, and fairly in lab skills. However, a significant decrease in the post-test compared to pre-test was seen in intervention group. Moreover, several features of lab skills were improved significantly in intervention group. It seems that students' cooperation in the project implementation was not acceptable. In general, the use of the simplest form of augmented reality technology was able to create an acceptable satisfaction in pharmacy students.

**Conclusion:** This type of AR-based booklets can be considered as promising educational strategy for medical students.

**Keywords:** Augmented Reality; e- learning; Lab course; booklet; Pharmacy.

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## “The Effect of Virtual Education on Nurses of Dr. Jalil Hospital’s Emergency Department CPR Team on the Promotion of Their Delivering Bad News Capability in 2021-2022”

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**Background:** The skill of delivering bad news to the patient and their family is one of the most complicated communication skills with a profound and considerable impact on the satisfaction and life quality of the patient and their family as well as the success in the continuation of the treatment process. In this regard, this study was carried out to investigate the effect of virtual education on delivering lousy news methods between Nurses of Dr. Jalil Hospital.

**Objectives:** Evaluation of virtual education effect on delivering bad news skills between nurses

**Materials and Methods:** This Field experiment study was performed with a pre-test and post-test pattern, control group, and statistical population of 20 individuals from the CPR team and Convenience Sampling in 2021-2022. Samples were randomly divided into two experimental groups and researcher-made questionnaires with the content validity and reliability conformation Cronbach's alpha coefficient %85. Utilize to gather data primarily, a pre-test was performed in two groups then the experimental group spent two weeks virtual education course. The post-test was carried out after 3 weeks as the questionnaires were filled in by individuals online. The Spss23 and descriptive-analytical tests were used for data analysis.

**Results:** Depending on analysis, The results revealed that teaching communication skills to individuals has a statistically meaningful promotive effect on the delivering bad news capability of the experimental group. ( $p < 0.001$ )

**Conclusion:** Considering the results defining organized programs for delivering bad news skill virtual education. Manner seems to be necessary for medical university.

**Keywords:** Bad news, Communication skills, Virtual technology

## “The strengths and weaknesses of the Fast Healthcare Interoperability Resources in the development of Electronic Health Records”

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**Background:** Despite using Electronic Health Record(HER) in a healthcare organization, interoperability of information is a severe problem between healthcare organizations. Fast Healthcare Interoperability Resources (FHIR) is a standard for exchanging data between different systems.

**Objectives:** We aimed to review the applications, advantages, and disadvantages of FHIR standards in the development of EHR

**Materials and Methods:** The PubMed and Scopus databases were searched for conducting this review in ۲۰۱۴-۲۰۲۱. We included studies that mentioned the application of FHIR standards in EHR, Electronic Medical Records (EMRs), or

Computerized Medical Records and noted the advantages and disadvantages of each.

**Results:** Finally, ۴۶ studies were accepted. Data exchange was the most used among the applications found for EHR, EMR, and PHR. using FHIR in EHR provides advantages such as interoperability, data exchange, and providing better services to patients. The most mentioned advantage of EMR was data display and visualization; in PHR, data interoperability was mentioned. Although increasing security is one of the advantages of using the FHIR standard, the lack of a clear and complete definition of security issues, as well as not considering authentication issues, was among the disadvantages of this standard.

**Conclusion:** The FHIR standard has many advantages, including saving time and money, interoperability of systems, and integration of different hospitals. In addition to these issues, paying attention to security issues, using a data dictionary, and specifying authentication to access data are necessary for the successful implementation of a system in healthcare organizations.

**Keywords:** FHIR, Health Information Exchanges, Electronic Medical Records

## “The application of tele-audiology in the implementation of Pure Tone, Dichotic Digit Test, and Speech In Noise/Silence tests to hearing screening”

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**Background:** According to the World Health Organization, more than 6% of people around the world suffer from hearing disorders. Most of these people live in developing countries and in areas where access to audiologists and hearing services, is not possible for them. One solution to these problems is to use tele-audiology.

**Objectives:** Investigating the use of tele-audiology in performing hearing tests for screening.

**Materials and Methods:** In ten years until December 2022; PubMed, Scopus, and Web of Science databases were searched. 22 articles that used telemedicine, tele-audiology, and mobile health to perform hearing tests for hearing screening were selected.

**Results:** In the reviewed studies, tele-audiology services were used in three forms. Computer software, mobile/tablet applications, websites, games, and video conferencing performed hearing tests in real-time. In some cases, hearing tests were performed using an audiometer, and converted into audio files, then sent to the audiologist, or a combination of methods was used. PT was used the most and no case was found where the DDT was performed using tele-audiology services.

**Conclusion:** Tele-audiology services can be used in remote areas where access to hearing services is limited. Using this technology can reduce travel and cost. Since the PT is not dependent on a specific language, this test can be performed in large populations with tele-audiology. When implementing tele-audiology services, we must pay attention to bandwidth speed, environmental noises, hardware issues such as charging devices, and security issues to have an effective implementation in this field.

**Keywords:** Tele-audiology, Telemedicine, hearing screening



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## “Speech therapy using Mobile Apps in COVID-19 epidemic”

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**Background:** COVID-19 epidemic and its consequences highlighted the importance of using telehealth systems and will affect the professional's attitude toward it.

**Objectives:** The aim of this study was to investigate rehabilitation professionals' of telehealth during COVID-19 epidemic in Iran.

**Materials and Methods:** A web-based cross-sectional study was conducted to assess the feasibility, satisfaction and attitude of rehabilitation professionals toward virtual training and telerehabilitation in COVID-19 epidemic. A total of 118 Occupational therapist, Speech therapist, Audiologist, Psychologist and educators completed questionnaire.

**Results:** The findings indicate that the correlations among satisfaction, feasibility, advantages, and compatibility were statistically significant (r ranging from 0.418 to 0.717). There were significant but low positive correlations between years of working experience and scores of feasibility and advantages. In addition, Means of feasibility, advantages, compatibility, and complexity scores in participants who provide telerehabilitation before COVID-19 pandemic were higher compared to other respondents.

**Conclusion:** According to the positive role of telehealth in a situation such as the COVID-۱۹ pandemic, health care systems should plan on creating mechanisms for its optimal use, protocol preparation, health professionals training, and infrastructure acquisition.

**Keywords:** Speech Therapy, Rehabilitation, Telehealth



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## “Effect of mHealth intervention using a nutrition app on food intake among workers of Taraz steel company, Shahrekord, Iran.”

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**Background:** Healthy nutrition is one of the most important indicators affecting human health and reducing the risk of some chronic diseases.

**Objectives:** This study aimed to determine the efficacy of mHealth intervention using a nutrition app on food intake among workers of a steel company in Shahrekord, Iran.

**Materials and Methods:** This interventional study was conducted as a before-and-after intervention study in 141 workers of Taraz Steel Company in 2021. We tested the efficacy of a 4-month intervention delivered via the web-based nutrition application with the name "Nutrition and Health" that designed by the researcher and an information technology engineer. Food intake frequency questionnaire was completed by workers before and four months after the intervention. The data were analyzed using SPSS 26.

**Results:** The results show that the amount of food intake (fruit, vegetable and dairy consumption) was significantly higher in the workers who used the nutritional app. There was no significant change in meat, bread and cereal consumption after the intervention.

**Conclusion:** Designing and implementing an educational program via mobile can have a positive effect on the pattern of consumption of fruit, vegetable and dairy consumption in workers.

**Keywords:** mHealth intervention, nutrition app, food intake, workers.

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## “Opportunities and Challenges of Tele-Sonography: A Review Study”

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**Background:** As technology advances, access to remote ultrasound equipment is expanding around the world and is used as a supportive health tool.

**Objective:** The purpose of this study is to investigate the opportunities and challenges of remote ultrasound.

**Method:** This review was conducted in ۲۰۲۲ by searching in reliable databases such as PubMed, Web of Science using keywords related to remote ultrasound without time limit. The inclusion and exclusion criteria of the study were simultaneously in the text of the article, articles published in reputable scientific

journals abroad and access to the full text of the articles and the English language of the articles. ۲۲ articles that met the inclusion criteria of the present study were included in the study.

**Findings:** The studies were based on performance evaluation and feasibility studies and training of Tele-Sonography. The statistical population of the studies was variable, interactions between the operator in the ultrasound center and the specialist outside were possible with smart devices, mobile phones and tablets. For video conference communication, studies stated that they used SKYPE software, studies used voice over internet protocol (VOIP) and other studies used different software. Also, remote ultrasound is done in two ways, synchronous and asynchronous. For the implementation of broadband Tele-Sonography, IP network, access software and video conferencing software are necessary.

**Conclusion:** Although simultaneous transmission is very necessary in emergency cases, information can be exchanged asynchronously when the Internet is down. SKYPE software is free and easily accessible, and also with low bandwidth, images can be visualized, and the transmission of information through it is secure, giving people the confidence that their information will be protected.

**Keywords:** tele-sonography, tele-ultrasound, telemedicine

## “The effect of educational triage application in disasters on the level of preparedness of pre-hospital emergency Technicians”

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**Background:** incidents often result in serious injuries. Accident-related fatalities may be reduced with proper triage training. Moreover, mobile apps may be useful tools owing to their many benefits.

**Objective:** This research aims to determine the impact of employing an educational triage application during catastrophes on the preparation of pre-hospital emergency personnel.

**Materials and Methods:** The educational triage application was designed interactively, and the scientific content and questionnaire were provided to the learners in the form of pre and post-test. This application included text, video, animation, a questionnaire, and a quiz section. In the questionnaire part, the questions were designed based on different scenarios of disasters, and the learners, in addition to answering the questions, also recorded their response time.

**Results:** 50 people volunteered to participate in the research. The scores before the intervention (mean  $\pm$  standard deviation) were  $24.3 \pm 0.3, 0.2$ , and the scores after the intervention (mean  $\pm$  standard deviation) were  $28.0 \pm 1.3$ . The study's results showed that the average performance score after the intervention with the educational triage application significantly increased compared to before the intervention ( $p < 0.001$ ). Also, the response time difference before the intervention

was 9.2 minutes, which decreased to 6.1 minutes after the study, which showed that the average response time difference after the intervention had decreased significantly compared to before the intervention ( $p < .001$ )

**Conclusion:** According to the research results, mobile learning has improved people's performance in the field of triage of the injured and significantly reduced triage time.

**Keywords:** Educational application, triage, pre-hospital emergency, disasters, preparedness, technicians



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## “Impact Of Mobile Health (mHealth) Interventions On Obesity”

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**Background:** Obesity is a global health problem that is increasing in prevalence. The studies about the impact of mobile health (mHealth) interventions on obesity management showed varied results in the efficiency of mHealth interventions.

**Objectives:** Author(s) should declare objectives/aims of the study. In this study the challenges and benefits of Mobile Health (mHealth) on obesity were reviewed and assess their effectiveness and provide recommendations for future research on the basis of evidence reported in reviews and meta-analyses.

**Materials and Methods:** The researches that accomplished in the field of mHealth interventions on obesity management were evaluated and the methods used in these studies were investigated. Studies were included if they described mHealth intervention designed to have a direct (ie, if the intervention was designed for obesity or for people who obese) or indirect (ie, if obesity was measured as an outcome) treatment effect.

**Results:** Results shows mHealth interventions associated with greater weight loss independent of age and degree of obesity at treatment initiation. However several studies propose that mHealth interventions are useful and promising, the results of this review indicate a deficiency of research in the expansion and trial of mHealth interventions on obesity and there is an essential need for future studies that use larger study samples, longer intervention and follow-up periods.

**Conclusion:** The results suggest that health experts should engage patients through mHealth technologies and try to boost digital health knowledge to promote obesity management at the national level.

**Keywords:** MHealth, Obesity, Digital interventions, Overweight



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## “Smartphone-based vital signal monitoring and Analysis”

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**Background:** Low oxygen saturation on admission has been reported as a strong predictor of in-hospital mortality in COVID-19 patients.

**Objectives:** The primary purpose of this system is to obtain physiological parameters using sensors and upload these parameters to the cloud. In this project, a device was designed using the Internet of Things (IoT) capability of the Arduino microcontroller, which measures parameters such as heart rate, blood oxygen level, and body temperature and displays them through mobile health.

**Materials and Methods:** Heart rate measurement and spo2 are done through the MAX30100 sensor module, which consists of red and infrared LEDs. Temperature measurement is done using a DS18B20 sensor to measure body temperature. The sensors module collects, calculates, and sends data to the cloud database for analysis based on normal values to detect abnormalities and displays on mobile phones.

**Results:** Arduino processed these sensors to detect heart rate, body temperature, and blood oxygen level. if oxygen saturation in the SPO2 is less than 92% and the temperature gets higher than 39 degrees Celsius, the device will send an alarm to the doctor's mobile phone.

**Conclusion:** This device is small, light, cheap, and portable. It has a high response speed. Viewing all three vital signs on the mobile phone reduces the process of diagnosing the patient's critical health condition. Our proposed intelligent health monitoring system allows doctors to identify individual patient information simply on the phone at their location.

**Keywords:** vital signal monitoring, smartphone-based analysis, blood oxygen saturation, heart rate detection

## A decision support system for diagnosis of acute lymphoblastic leukemia using a deep learning method

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**Background:** Artificial intelligence has recently shown remarkable success in analyzing medical images due to the rapid expansion of deep learning algorithms.

**Objectives:** Researchers in this study aimed to provide accurate diagnosis and classification of acute lymphoblastic leukemia by processing microscopic. This diagnosis approach is based on deep learning, which is the core of the clinical decision system.

**Materials and Methods:** A large number of pathological images related to acute lymphoblastic leukemia and healthy cells are chosen. The dataset CodaLab competition included 12,528 images of 4,037 healthy cells and 8,491 leukemic cells. Extracted critical features were used to classify acute lymphoblastic leukemia and healthy cells by a pre-trained network, i.e., VGG 16. From the total number of images, 80% (10022 numbers) were used as training data and 20% (2506 numbers) as test data. The activation for all layers except the last layer was the ReLU function. Adam was selected for the optimization function with a learning rate of 0.0001. The intelligent diagnostic system was created using the Java programming language.

**Results:** The training accuracy of the VGG-16 is 97.41%, and the validation accuracy is 84.62%. Precision, recall, and F-measure related to leukemia class are 0.88, 0.91, and 0.90, respectively. VGG-16 was used as the processing core in the decision support system.

**Conclusion:** This system in medical centers is helpful for purposes such as timely diagnosis, reducing patient hospital stay and treatment costs, and improving the patient referral system.

**Keywords:** Deep learning; Image Processing; Acute Lymphoblastic Leukemia; Clinical Decision Support System

## “Towards a smartphone-based application for predicting the kidney transplantation survival”

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**Background:** Due to the costly and disabling problems of kidney transplantation and the possibility of organ rejection, designing a mobile phone-based application for survival analysis can be very useful.

**Objectives:** In this study, by using data mining algorithm, a mobile phone-based application was designed to predict the survival of a patient's kidney transplantation.

**Materials and Methods:** The requirements and capabilities of a smartphone-based application were determined by a researcher-made questionnaire and assessing the users' information needs at the first stage, and at the second stage, by using information obtained from the questionnaire, a checklist was prepared, and the information of patients with kidney failure was collected. The smartphone-based application for the prediction of kidney transplant survival was designed and evaluated. The core of the application operates by the C5.0 tree.

**Results:** Body mass index, cause of renal dysfunction, and duration of dialysis were evaluated in all models as the most influential factors in transplant survival. The accuracy of the C5.0 is 96.77%. By using the results obtained from the questionnaire, we assessed the usability and user satisfaction of the application, which were at an optimal level.

**Conclusion:** C5.0 algorithm was the helpful model with high validity, confirming its strength in predicting survival. The designed app can be applied effectively in predicting kidney transplant survival.

**Keywords:** kidney transplant survival, Application, Chronic kidney disease.



## “Monitoring and controlling people with urinary stone diseases by an application”

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**Background:** Self-care using mobile applications plays an important role in today's health industry. Active participation of patients in treatment can increase the quality of care and reduce the main costs.

**Objectives:** This research aims to identify and validate information content and functional capabilities and design a mobile phone-based application for patients with urinary tract stones.

**Materials and Methods:** First, with a review of similar studies and applications, essential information items and capabilities were identified. Then, a researcher-made questionnaire was designed based on the previous step. Finally, the

information content and functional capabilities of the questionnaire were surveyed by patients with urinary tract stones, urology, and nephrology specialists. The initial sample of the mobile-based application was created in Java language.

**Results:** The cause for the formation of different stones, clinical and laboratory manifestations, treatments, the role of environmental factors in treatment, the role of nutrition in the treatment and construction of stones, and different diagnostic methods are among the most critical informational elements of the application. Medication reminders and liquid consumption, reminders for doing radiography, and providing information about medical centers are also among the most important features of the application. The results of the evaluation of the program's applicability by experts showed that the app's applicability for patients with urinary tract stones is at an acceptable level.

**Conclusion:** The current innovative program has the potential to control urinary tract stones and enables the self-care process.

**Keywords:** Self-care, Mobile-health, Urinary stone disease.

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## “Telemedicine and Mobile Health Technology Are Effective in the Management of Diseases: A Narrative Review”

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**Background:** Gastrointestinal diseases are one of the most costly diseases, and hospitalization greatly increases direct medical costs. Health telematics is a growing technology that offers significant remote service delivery capabilities for patients. Mobile health is key to modern health solutions, methods of ability to connect anywhere, anytime.

**Objectives:** The purpose of this study was to determine the capacity of telematics and complementary health to provide health services and medical care for illnesses.

**Materials and Methods:** The EBSCO, PubMed, and Web of Science databases were consulted using medical headings and other keywords to identify telemedicine studies related to healthcare delivery. The PRISMA guidelines were used to enumerate 20 research papers.

**Results:** Telematics and m-Health provide useful health services and overcome geographic, temporal, and even organizational barriers. Research shows that this technology can solve new problems in healthcare; the increase in the number of chronic lifestyle-related diseases, the high costs of existing health services, and the need to enable patients and families to care for themselves should be the way of the future. However, integrating mHealth into clinical care poses numerous challenges.

**Conclusion:** Overall, telematics and mHealth interventions improve quality of life, make a significant contribution to patient satisfaction, and play an important role in palliative care and patient support. Telemedicine and mobile health technology can be useful for the management of diseases and the improvement of patients' quality of life.

**Keywords:** Mobile health, MHealth, Telematic, Review, Diseases

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## “Application of mobile health in liver transplantation: a scientometrics study”

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**Background:** Patients who have undergone liver transplantation need self-care after transplantation. Mobile health is one of the technologies that can help patients in this field.

**Objectives:** This study aimed to investigate the scientific production of mobile health usage in patients undergoing liver transplantation.

**Materials and Methods:** In the current descriptive study, the records were retrieved from Medline by combining mesh terms of telemedicine and liver transplantation. Then the desired data was extracted from the records, entered into the checklist, and analyzed using Excel software.

**Results:** A total of 30 records were retrieved, the United States being the most prolific country contributing to the production of 16 records. Iran did not have any published records. Shimul A Shah was the most active author in this field, with four records. The universities of California and Cincinnati were the most productive institutions. "Studies in health technology and Informatics" journal published the most record (N=9). The highest number of published records was in 2021, with nine studies.

**Conclusion:** It is necessary to adopt appropriate policies in order to conduct research in this field in Iran.

**Keywords:** Mobile health, Liver transplantation, Scientometrics.



## “Application of Technologies in the Design, Production, Management and Distribution of COVID-19 Vaccination: A Systematic Review”

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**Background:** COVID-19 vaccination is the most effective measure in combating the COVID-19 spread. Information technology (IT) is one of the latest advancements in designing vaccines.

**Objectives:** The present study aims to investigate the applications of technologies in the design, production, management, and distribution of COVID-19 vaccines.

**Materials and Methods:** The search strategy was done by using the keywords "COVID-19", "Vaccine", "Information technology" and their synonyms in PubMed, Scopus and Web of Science databases from 2019 to April 2022. The inclusion criteria were original studies, published in English, in which IT had been

employed to design, produce, manage and distribute COVID-19 vaccines. Finally, the characteristics of eligible studies were examined.

**Results:** 11 articles were included in the study. 63.7%(n=7) of studies have used artificial intelligence technologies such as machine learning, artificial neural network, and deep learning. The web-based programs and text messages were applied in 18.1%(n=2) of articles. The GIS software, OpenStreet and satellite images were used in 9%(n=1) of studies. Also, the OpenSafely platform was employed in 9%(n=1) of investigations. These technologies were used for the distribution (n=4), design (n=3), and management of vaccines, such as tracking clinical complications of vaccines (n=2). Moreover, 18.1%(n=2) of studies employed these technologies for simulating the vaccines before production.

**Conclusion:** IT has played an effective role in the design, production, management, and distribution of COVID-19 vaccines. Considering the financial and legal aspects of IT in this field to improve the use of technologies, is suggested.

**Keywords:** COVID-19, Vaccine, Vaccination, Information Technology, Systematic Review

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## “Determination of Lamotrigine using Colorimetric Assays coupled to Smartphone Image Analysis”

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**Background:** This study is based on the color variation found for reaction of sucrose functionalized Au nanoparticles (Suc-AuNPs)/ 3,3',5,5'-tetramethylbenzidine (TMB)/H<sub>2</sub>O<sub>2</sub> system with different concentrations of lamotrigine. The image analysis was carried out with the help of an app (PhotoMetrix®) on a smartphone. The analysis was based on univariate calibration using the red-green-blue images' histograms. Then, as a multivariate calibration method, PARAFAC was used to analyze the data on Matlab software. This method quantified lamotrigine in exhaled breath condensate (EBC) as real sample in a fast, low-cost, and portable approach

**Objectives:** A colorimetric approach for detecting lamotrigine using smartphone image analysis is described in this study.

**Materials and Methods:** Suc-AuNPs, TMB, H<sub>2</sub>O<sub>2</sub>, and lamotrigine as materials, a handcrafted rectangular photography box, smartphone as instrument and, Matlab, PLS- toolbox, PhotoMetrix as software were used in this study.

**Results** The approach was fully validated and used to measure lamotrigine in EBC of four volunteers receiving therapeutic doses of lamotrigine to check the applicability of the validated method.

A comparison was performed between found lamotrigine concentrations in real EBC samples by using UV-VIS, photometrix app and PARAFAC (as image analysis method). The results show that the images obtained from the unknown samples can be estimated with a high percentage of accuracy.

**Conclusion:** We described a new method for determining lamotrigine in solution based on the analysis of digital images taken with a smartphone. For both the validation and prediction sets, an image analysis approach was tested to predict lamotrigine concentrations in aqueous solution, and the results obtained were highly satisfactory.

**Keywords:** Lamotrigine; Smartphone, colorimetry.

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## “Serious Games for patients with Liver Diseases: A Systematic Review”

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**Background:** Teaching science through serious games is known as a successful method in medicine. To this end, this systematic review is conducted on serious games for patients with liver disease.

**Objectives:** This study aims to conduct a systematic review to assess whether serious games affect liver disease outcomes. In addition, the effect of assessment tools, intervention type, and study quality were investigated.

**Materials and Methods:** Articles were searched in Pubmed, Science Direct, Scopus, IEEE, Cochrane, and Embase databases until December ۱, ۲۰۲۲. Two independent researchers extracted data and ۲۲۹۰ articles were retrieved. In the end, nine studies were included in the study.

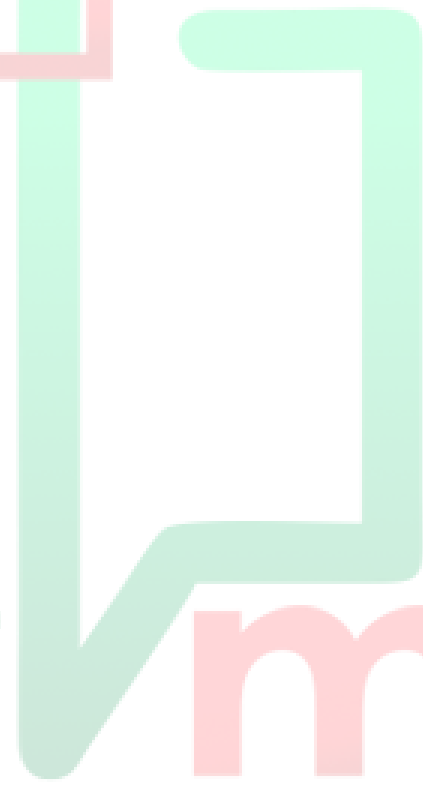
**Results:** We measured the outcome measures of the type of disease, the duration of the game and intervention, the target group, and the "results of interest". More than half of the articles included skills training that used the VR method. More than ۷۰% of the studies had significant results and three studies showed a significant change

in liver cirrhosis. The maximum playing time of the game was an hour, and the maximum intervention time was two years.

**Conclusion:** Our study shows the potential of serious games to improve health outcomes in people with liver diseases. However, the results suggest that more intensive interventions should be designed and tested for diabetes and fatty liver disease to support their impact on improving health outcomes. Also, since “Game-Log” is one of the valuable outcome measures in evaluating games, it is suggested that researchers use “Game-Log” data to evaluate more results.

**Keywords:** Serious Games, Liver Disease, Hepatitis, Gamification.

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## “Physicians’ View on Telemedicine during the Corona Outbreak: A Cross-Sectional Study Conducted in Imam Reza Teaching Hospital of Mashhad”

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**Background:** Teaching science through serious games is known as a successful method in medicine. To this end, this systematic review is conducted on serious games for patients with liver disease.

**Objectives:** This study aims to conduct a systematic review to assess whether serious games affect liver disease outcomes. In addition, the effect of assessment tools, intervention type, and study quality were investigated.

**Materials and Methods:** Articles were searched in Pubmed, Science Direct, Scopus, IEEE, Cochrane, and Embase databases until December 1, 2022. Two independent researchers extracted data and 2290 articles were retrieved. In the end, nine studies were included in the study.

**Results:** We measured the outcome measures of the type of disease, the duration of the game and intervention, the target group, and the "results of interest". More than half of the articles included skills training that used the VR method. More than 70% of the studies had significant results and three studies showed a significant change in liver cirrhosis. The maximum playing time of the game was an hour, and the maximum intervention time was two years.

**Conclusion:** Our study shows the potential of serious games to improve health outcomes in people with liver diseases. However, the results suggest that more intensive interventions should be designed and tested for diabetes and fatty liver disease to support their impact on improving health outcomes. Also, since "Game-Log" is one of the valuable outcome measures in evaluating games, it is suggested that researchers use "Game-Log" data to evaluate more results.

**Keywords:** Serious Games, Liver Disease, Hepatitis, Gamification.

## Investigating the Effect of Gamification Method on the Learning of Nurses and Nursing Students: a Review article

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**Background:** Gamification improves the outcomes by using mental and mechanical processes and creating a game space in non-game conditions. It can create motivation and cause executive changes in learners. This method was considered at the beginning of the third millennium and received more attention in the academic settings in the second decade of the 21st century thanks to its attractiveness in education. It has also been welcomed recently by the health team.

**Objectives:** The present study aims to investigate the effect of gamification on the learning of nurses and nursing students.

**Materials and Methods:** In this study, documents published between 2013 to 2022 were reviewed using the keywords of game, learning, nurse, and nursing student in reliable databases, including Web of Science, PubMed, Science Direct, and Scopus.

**Results:** A total of 991 articles were found, and 33 of them were included in the study given the inclusion and exclusion criteria. The results revealed that gamification method for nurses can be an effective intervention in teaching inhalation methods and strengthening Jurisprudence education in nurses, improving decision-making and clinical judgment, diet education, learning exposure, emergency care of cardiovascular patients, care of Septicemia patients, drug

calculations, and learning courses such as community health nursing in nursing students.

**Conclusion:** It can be concluded that using gamification plays a significant role in classroom training and in improving the psycho-motor performance of nursing students. Also, it provides better training for nurses and clients and can even be used in in-service courses.

**Keywords:** Game, Learning, Nurse, Nursing Student.



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## "A mobile-based decision support system to assist dietitians in adjusting the diet for patients with Multiple Chronic Conditions"

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**Background:** Multiple Chronic Conditions (MCC) means living simultaneously with two or more chronic conditions. Due to the multifaceted nature of MCC, setting a diet for these patients is complicated and time-consuming.

**Objectives:** Modeling a fuzzy logic system to aid dietitians in adjusting the diet for patients with MCC.

**Materials and Methods:** This was an original study. Mamdani fuzzy logic with 1144 rules was applied to model the system in MATLAB. The system could recommend the diet for MCC patients over 18 years suffering from one or more chronic diseases, including obesity, diabetes, hypertension, hyperlipidemia, and kidney disease, to dietitians. One hundred nutrition records from three nutrition clinics were employed to measure the system's performance. The system outputs were compared with the diet adjusted by three experts using Wilcoxon and Sign tests.

**Results:** The findings showed that the diet set by nutritionists has no statistically significant difference from the diet recommended by the system ( $p > 0.05$ ), and they were the same with an average of 98%. Furthermore, the percentage of agreement between the system and the experts in the amount of energy, carbohydrate, protein, fat, and five food groups in the diet was 94, 99, 97, 98, and 97, respectively.

**Conclusion:** This system could adjust the diet with high accuracy as well as humans. In addition, it could increase dietitians' confidence, precision, and speed in setting the diet for MCC patients. Moreover, fuzzy logic was a suitable algorithm to model decision support systems to recommend the diet.

**Keywords:** Multiple Chronic Conditions, diet, Clinical Decision Support Systems, Fuzzy logic.

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## " A survey on the satisfaction of pharmacies with electronic prescribing"

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ORCID: 0000-0002-7220-2990.

**Background:** Electronic prescription is one of the methods based on information technology to decrease medication errors. This technology has many advantages and overcomes the problems of paper prescriptions. It has also significantly reduced medical errors. The lack of sufficient studies regarding electronic prescription in Iran was a motivation to fulfill this study.

**Objectives:** Determining the satisfaction levels of pharmacy employees with the implementation of electronic prescribing.

**Materials and Methods:** This was a cross-sectional descriptive study conducted in 2022. The data were obtained through a researcher-made questionnaire from the pharmacies of Ahvaz (a metropolis located in the southwest of Iran). The employees of the pharmacies that used the electronic prescription system participated in the study by responding to the questionnaires.

**Results:** A total of 80 questionnaires belonging to 30 pharmacies were included in the study. The results showed that 60% of the participants believed electronic prescription technology improved prescription medicine. In addition, 84% of the

employees found it easy to work with the e-prescription software. However, ۸۱% of the participants believed the software had many problems. Also, ۷۷% of the respondents had issues with internet speed.

**Conclusion:** Despite problems such as slow internet speed, software problems, and time wastage, ۷۳% of the respondents were satisfied with the electronic prescription system. Reducing the issues and providing more training to employees will increase satisfaction with this system.

**Keywords:** Electronic Prescribing, Medication Errors, Telemedicine, Pharmacy



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## “The position of a metaverse in the field of medical sciences”

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**Background:** The metaverse refers to the digitized earth as a new world that emerges through digital media such as smartphones. Some metaverse applications have already been utilized in medical science. Therefore, it is important to understand the concept and branches of the metaverse and samples of its medical applications.

**Objectives:** The aim of this study was to understand the concept of the metaverse and its applications in the field of medical sciences.

**Materials and Methods:** The type of study was a systematic review. The search strategy was without a time limit. The studies were collected through a screening of the electronic databases PubMed, Scopus, and the Web of Sciences. A total of 978 studies were detected after the screening. Most of the excluded articles were related to other topics.

**Results:** The findings indicate that the literature on this topic is limited to a few checks of the literature and editorials. Only ۲۴ articles were included, and ۱۳ of them were added in a second moment. The aspects related to this virtual world in terms of health prevention and the treatment of clinical conditions, education, training, and research are discussed.

**Conclusion:** The metaverse could be considered an effective instrument to connect easily and quickly to the population. Therefore, it is suggested that people who work in the field of medical sciences have a broader view of the metaverse because the metaverse can be used in the health, prevention, and treatment of clinical conditions.

**Keywords:** augmented reality, metaverse, smartphones, virtual reality

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## “A novel approach to differential diagnosis of irritable bowel syndrome (IBS) using a diagnostic clinical decision support system (CDSS): development and evaluation of proposed model”

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**Background:** IBS symptoms are comparable to those of other illnesses, like functional dyspepsia, making it challenging for specialists to diagnose it today. Physicians currently rely on therapeutic guidelines and their own experiences to diagnose this condition. Prolonged treatment time, misdiagnosis, and additional costs are all possible issues of this approach. Researchers suppose that CDSS when utilized by clinicians to prop in decision-making, can be an impressive response to problems.

**Objectives:** The present study intends to diagnose IBS through CDSS.

**Materials and Methods:** In this applied modeling research, we collected data from the eScholarship@UMassChan repository, and used MATLAB software version

2018 for simulation and programming purposes. An optimized Fuzzy-logic model based on the particle swarm optimization (PSO) technique was used to develop the prediction model. The dataset was broken up into training (70%) and testing (30%) data. The model performance was determined by values of accuracy, specificity, precision, sensitivity, kappa test, confusion Matrix, and F-measure.

**Results:** The findings of the study showed that our optimized model demonstrated advanced function in the differential diagnosis of IBS (accuracy 96.0%, sensitivity 100%, specificity 89.4%, and precision 90.2%).

**Conclusion:** According to the findings, this optimized model has a substantially excellent performance in predicting individuals with IBS. So, to the best of our knowledge, this is the earliest research to apply PSO approach-based optimized fuzzy logic algorithm to IBS differential diagnosis; Likewise, it can aid in developing a state of art CDSSs in real-world clinical settings.

**Keywords:** irritable bowel syndrome; clinical decision support system; diagnosis

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## “The Effect of an app-based Intervention on women's Self-stigma and Openness toward Formal Help-seeking for Sexual Concerns and problems”

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**Background:** Despite the high prevalence of sexual concerns and problems among women, formal help-seeking is low. Aside from the stigma associated with discussing sexual health difficulties in public, embarrassment may be a major barrier to getting the required care.

**Objectives:** we aimed to investigate the effect of a mobile app-based psychosexual intervention on improving openness and stigma related to help-seeking of women regarding sexual concerns and problems.

**Materials and Methods:** This study was a parallel randomized controlled trial, performed during December 20, 2021, to January 12, 2022, with random blocks of 4 among 119 women in Iran, Rasht. Data collection tools included a demographic data questionnaire, openness to help-seeking and self-stigma questionnaire. The intervention group received psychosexual intervention using a mobile app, while the control group received an unrelated intervention regarding menstruation hygiene using the easy period app. The intervention lasted six weeks, and the outcomes were assessed at baseline, immediately after, and eight weeks after the intervention

**Results:** The scores of Openness towards formal help-seeking were significantly different in the intervention group in comparison with the control group ( $p < 0.001$ ) and unlike at week 8. Self-stigma scores were significantly different in the intervention group in comparison with the control group following the intervention ( $p = 0.009$ ), and at week 8 ( $p = 0.028$ ).

**Conclusion:** The present study supports the efficacy of using a mobile app installed on women's smartphones to improve openness and stigma related to formal help-seeking for sexual health issues.

**Keywords:** sexual health, help-seeking behavior, mobile app

## “Mobile applications for early diagnosis and treatment management in patients with mouth neoplasm: a systematic review”

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**Background:** Mouth neoplasm is among the most common cancers globally, especially in low- and middle-income countries. In recent years, mobile applications have enabled early diagnosis of cancer and prevention of side effects during treatment.

**Objectives:** This study aimed to review mobile applications for early diagnosis and treatment management in patients with mouth neoplasm.

**Materials and Methods:** This article was a systematic review. Related papers were searched using various databases, including Web of Science, PubMed, Scopus, and Google scholar. The time frame was between January 2010 and September 2022.

Initially, 294 articles were retrieved and after reviewing the titles, keywords, abstracts and full text of the identified sources, finally, 23 articles were included in the study.

**Results:** The results of this study showed that the use of mobile applications can be effective in improving the condition of patients with mouth neoplasm. These are used in four different ways: early diagnosis of cancer (30,4%), increasing patient-doctor communication (30,4%) and improving medication adherence (17,3%). The most popular application included monitoring symptoms and treatment side effects (22,1%).

**Conclusion:** Mobile applications facilitate remote monitoring so that cancer patients can take more responsibility for health controlling, empowerment supporting, safety improving and quality of their care. They also help reduce the number of visits to health institutions, save time for doctors and patients, and create effective communication between doctors, patients and their families and provide easy access to information to help manage side effects.

**Keywords:** Mouth Neoplasm, Self-management, Self-care, Smartphone, Mobile Applications

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## “Applications of blockchain in healthcare industry; A Systematic Literature Review”

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**Background:** Background: One of the challenges in healthcare organizations is protect of health data. Blockchain describes a technological concept which stores data in a central database distributed among network of computer and is excellent technology for protecting confidential data within the system.

**Objectives:** The aim of this study was to review and assessment applications of blockchain in healthcare industry.

**Materials and Methods:** This was a Systematic Review. Four electronic databases; Web of Science, PubMed, Scencedirect and Scopus, were searched in September 2022 using search terms for Blockchain, mHealth, healthcare organization. Search was limited to English-written articles. The screening process of articles was conducted by two-reviewer respectively. The PRISMA protocol was used to select articles.

**Results:** In total 13 articles were found our criteria. Major Applications of blockchain in healthcare consist of keeping safe and secure sensitive information

Patient medical data and empowering patients to control their own health data. Sharing pertinent information quickly and safely and also as a mechanism to secure Electronic Health Record (EHR) is another application of blockchain in healthcare. Increasing transparency, Patient medical data management, encryption, enabling consumers to authenticate the identities of organizations, contracts, tract transactional details and Enabling faster data transfer between hospitals and medical insurance providers, and healthcare organizations are another application of Blockchain in health industry.

**Conclusion:** Blockchain networks provide an easily-authenticated, secure platform for integrating data. The results showed that Blockchain technology has the potential to transform health care and can improve the performance, security, and transparency of sharing medical data.

**Keywords:** Mobile health, Blockchain, Healthcare, blockchain technology, Protect

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## “Investigating the Effect of Using Mobile Health in Inflammatory Bowel Disease (IBD)”

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**Background:** Inflammatory bowel disease (IBD), which includes 2 complex diseases, ulcerative colitis and Crohn’s disease, is a chronic inflammatory condition with an important medical and financial impact for patients. Telemedicine is the application of ICTs for providing health care services at a distance without needing direct contact with the patient.

**Objectives:** The study aimed to identify the effects of using telemedicine in patients with (IBD) and benefits.

**Materials and Methods:** In this research, PubMed and Scopus databases were used and all articles were reviewed based on the PRISMA method. There are 3 criteria for entering articles: 1- Original article; 2- Its main language is English and 3- The

implemented in the field of Tele-IBD has been done. Short articles and reviews were excluded. The search strategy was based on MeSH keywords and until 2022.

**Results:** The articles found in the search process were 279, which were reduced to 7 after checking the inclusion criteria. These articles included 3 fields of women, adults and 14-year-old youth, with a frequency of 2, 1, and 1 respectively. There are two forms of communication using the application (3) and text message (1) which were done by the patients.

**Conclusion:** Tele-IBD is a safe platform for IBD clinical service providers and an effective way of communication between the patient and the doctor. It also reduces the need for in-person outpatient appointments. Therefore, it seems necessary to create an appropriate educational infrastructure and technology in the field of Tele-IBD.

**Keywords:** Telemedicine, Inflammatory Bowel Disease, Mobile Health.

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## “The Evaluation of Mobile Health Application in Natural Disaster Management”

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**Background:** Mobile-health(mHealth), a promising domain, applies appropriate medical and health measures using smartphones, patient monitoring apparatus, personal digital assistants, and other wireless devices. It also helps us design more efficient management patterns, select appropriate policies, and achieve better decision-making on a large scale.

**Objectives:** The main objective of this research is to evaluate mhealth usage in natural disaster management.

**Materials and Methods:** We designed this study as a review article in 2022. PubMed was selected as the main source. The keywords used for extracting related studies included the following: eHealth, mHealth, disaster medicine, and natural disaster. The authors opted for the relevant articles published between 2017 and 2022. We extracted 04 articles, nine of which included the plausible keywords.

**Results:** According to the studies, the main objective of Disaster E-Health (DEH) technologies can be divided into two main categories: clinical and non-clinical. Non-clinical objectives consist of administrative, educational, and research sections. The clinical section includes all responsibilities and measures which aim to improve hygiene and therapeutic services for natural disaster victims. Related technologies, including artificial intelligence, decision support systems, positioning systems, the internet of things, and other computer-based devices can help disaster management provide better healthcare before, during, and after these calamities.

**Conclusion:** DEH technologies can improve management, facilitate acceptable responses, and solidify support after unwanted events. The studies show that mHealth has a high potential to assist all stages of disaster management cycle. Also These tools have crucial roles in improving governmental policy-making processes, as well.

**Keywords:** Natural Disaster, Disaster E-Health, mHealth, DEH

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## “Application of mobile Health in Self-Care of Liver Patients: A Review Study”

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**Background:** Mobile health was introduced by the WHO as the provision of healthcare services using digital technologies, which are rapidly expanding worldwide. Liver diseases have extensive complications and mortality rates worldwide. The use of mobile health can play an important role in the management of liver disease.

**Objectives:** The purpose of this review study is to investigate the Application of mobile Health in the Self-Care and Treatment of Liver Patients.

**Materials and Methods:** This is a systematic review, conducted in ۲۰۲۲. The search was done in PubMed and Web of Science scientific databases with a combination of related keywords such as mobile health, liver disease, and telehealth. Data extraction was done using a data extraction form and summarized and reported based on the study objectives.

**Results:** From the ۲۹۱ articles found in the initial search, based on the inclusion and exclusion criteria, finally ۱۲ studies were included. According to the results

66,7% of the articles (8 articles out of 12), mobile health increases the level of access to healthcare services, saves time and money, and patient management. Also, 33,3% (4 articles out of 12) show that the use of mobile applications is very effective for controlling adherence and daily drug consumption, screening, diagnosis, and encouraging patients to treatment.

**Conclusion:** According to the results, mobile health could be able to facilitate the access of liver patients to specialized care, improves interaction, increases follow-up, and disease tracking, and reduces delays for rural patients who seek treatment.

**Keywords:** mobile health, liver disease, telehealth

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## “Application of virtual reality on reducing patients anxiety: a review study”

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**Background:** Virtual reality is a computer technology that gives users the experience of being in a simulated ۳D environment and is considered as a non-medicinal tool to reduce patients anxiety.

**Objectives:** The purpose of this review study is to investigate the use of virtual reality on reducing patients anxiety.

**Materials and Methods:** This research was conducted in a review method in ۲۰۲۲ and through searching in PubMed and Web of Science databases and Google Scholar search engine with keywords such as Virtual Reality, Anxiety, Patient. Data collection was done using a data extraction form and the obtained data were analyzed, summarized and reported based on the objectives of the research.

**Results:** From the ۱۱۲۱ articles found in the first stage of the search based on the inclusion and exclusion criteria, ۲۲ articles were finally included in the study.

According to the results of 27% of the articles, virtual reality reduces children's anxiety before and during therapeutic interventions. The results of 32% of the articles show that virtual reality reduces the anxiety and distraction of adult patients before or during surgery. Virtual reality is effective in reducing the anxiety of Parkinson's patients and patients undergoing chemotherapy as well as pain caused by physical therapy.

**Conclusion:** Virtual reality is an effective and suitable method to reduce the anxiety of patients before or during therapeutic interventions, which increases the readiness of patients to deal with the disease, improves the quality of treatment, and increases patient satisfaction.

**Keywords:** Virtual Reality, Anxiety, Patient

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## “Investigate the impact of Metaverse on Mental health”

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**Background:** Metaverse is a new form of web-based technology that has enabled people to have extensive social interactions. Mental health problems are a global problem. Metaverse is actually the result of merging physical and digital environments.

**Objectives:** The purpose of this review study is to investigate the impact of metaverse on mental health.

**Materials and Methods:** This research was conducted through a review method in 2022 and through a search in the PubMed database and Google scholar search engine with key words such as Metaverse, Mental Health, virtual reality. Data collection was done using a data extraction form and the obtained data were analyzed, summarized and reported based on the objectives of the research.

**Results:** From the 16 articles found in the first stage of the search based on the inclusion and exclusion criteria, 9 articles were finally included in the study. According to the results of the majority of articles, virtual reality (VR) is an essential technology for the metaverse. The use of virtual reality and Metaverse by reducing everyday stress and being in a calm environment brings peace of mind to

users. There is also the ability to provide counseling services to improve mental health in the metaverse environment.

**Conclusion:** Based on the findings of this study, with the spread of digital technologies around the world, including metaverse and virtual reality, we can see the spread of social interactions. This 3D environment is similar to life in the real environment, which can reduce the level of anxiety and stress in areas using this virtual environment.

**Keywords:** Metaverse, virtual reality, mental health



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## “A systematic review of the effectiveness of mobile apps for mental health”

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**Background:** Despite a large number of mobile apps in the field of mental health, it is difficult to find a useful and reliable one, mainly due to the fact that the effectiveness of many apps has not been assessed scientifically.

**Objectives:** The present study aimed to assess the effects of mental health apps on managing the symptoms of stress, anxiety, and depression.

**Materials and Methods:** A comprehensive literature search was conducted in PubMed, Scopus, EMBASE, Cochrane, and Web of Science databases for the papers published from ۲۰۰۰ to ۲۰۱۹.

**Results:** A total of ۴۹۹۹ peer-reviewed articles were identified, out of which, nine systematic reviews met the inclusion criteria. Results showed applications that used behavior change strategies, such as Cognitive Behavioral Therapy, Acceptance and Commitment Therapy, and Behavioral Activation reported significant effects on depression, anxiety, and stress.

**Conclusion:** It seems that mental health apps can be promising media for reducing depressive symptoms. This field is an emerging area of mobile health, and further research should be done in future in order to reach conclusive evidence.

**Keywords:** Telemedicine, Stress, Depression, Anxiety



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## “Mitigate psychological impact of COVID-19 Pandemic through a mHealth initiative”

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**Background:** The prevalence of mental health disorders is increasing globally, and the prevalence of COVID-19 has made it worse. Evidence has indicated a major mental health burden and elevated anxiety associated with the new coronavirus outbreak in the general population.

**Objectives:** This study aims to offer an evidence-based app for stress management among Iranian population during COVID-19 outbreak.

**Materials and Methods:** An evidence-based app should develop according to psychological theories such as Acceptance and Commitment therapy, Cognitive Behavioral Therapy, and Stress Inoculation Therapy. Also, it is important to scientifically approve the app through an RCT for effectiveness on managing stress.

**Results:** It is essential to provide an app with specific feature to increase acceptability among users. Weekly reminder, feedback capability, user customization capability, and interaction capability are important feature to keep in mind. In addition, mood evaluations capability should be included in the app so that users could measure their stress on a daily basis and view the results on a daily, weekly or monthly basis on a chart. For this purpose, use of visual analog scale (VAS) can be useful.

**Conclusion:** Mental health has been negatively affected due to COVID-۱۹ imposed restrictions as well as limited access to professional counseling services. In this regard, we can help people to promote their mental health through developing a reliable and evidence-based app.

**Keywords:** COVID-۱۹, Stress, Mental Health, Telemedicine

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## “Telemedicine and burns: an overview”

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**Background:** Telemedicine is increasingly used, especially in low- and middle-income countries, to provide health care, including the diagnosis and management of burns.

**Objectives:** The purpose of this study is to investigate the use of telemedicine in the treatment of burn patients.

**Materials and Methods:** MEDLINE/PubMed, Embase, Web of Science, and Google Scholar were searched. Studies were eligible for inclusion if they were published between 2012 and 2022. MeSH terms such as “Telemedicine” with entry terms of “mHealth”, “mobile health”, “telehealth”, “eHealth” as well “burns” and “self-care” were used.

**Results:** The findings revealed that telemedicine can contribute to increase patients’ knowledge about burn conditions, improve self-care skills, remote patient follow-up, teleconsultation, medical education, as well doctor-patient relationship. This technology can also help reduce the costs of patients' transportation and treatment, decrease unnecessary referrals and outpatient visits, expand access to burn care to rural communities, especially in low- and middle-income countries, and enable greater allocation of scarce specialist resources at the burn center.

**Conclusion:** Incorporating mHealth technologies into the daily processes of burn care can improve the quality of burn care services.

**Keywords:** Burns, Telemedicine, Mobile Applications, Self-Care

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## “The benefit of telemedicine interventions for obesity care”

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**Background:** Obesity is a major public health concern worldwide and it will continue to be a public health problem in the coming years. In this regard, telemedicine can support patients with obesity.

**Objectives:** The aims of our study were to identify the role of telemedicine strategies in nutritional monitoring in obese patient at 2023.

**Materials and Methods:** This is a review study which was done in 2023. Searching was performed in online databases and search engines including PubMed, Scopus, Science Direct and google scholar. The criteria for inclusion were English original

papers about obesity that used telemedicine. Related articles were selected based on inclusion and exclusion criteria.

**Results:** our research showed that telemedicine led to create more robust, accessible, and effective weight management programs. Moreover, this study showed that the use of telemedicine provided good support for patients in obesity management and it leads to better nutrition regimen adherence and weight outcomes. Also, results indicated that obese patient were highly satisfied with the telemedicine interventions.

**Conclusion:** Telemedicine could be a suitable tool for support the continuity of care in obese patients. Due to convenience, patient preferences and efficiency, it is expected that telemedicine will be recognized as a valuable tool and its use will be maximized and integrated with face-to-face visits.

**Keywords:** Obesity, Telemedicine, eHealth, Overweight

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## “Remote consultation in the era of COVID-19 pandemic”

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**Background:** Since COVID-19 pandemic led to restrictions in face-to-face consultations, telemedicine used as a useful tool in providing continuity of care.

**Objectives:** The aim of this study was to evaluate advantages and disadvantages of remote consultation during the Covid-19 pandemic.

**Materials and Methods:** The present review study conducted according search in PubMed, Scopus, Science direct, and Google Scholar. English language and keywords such as: Tele-medicine, Remote Consultation, and Covid-19 were used for the search.

**Results:** The findings of this study showed that remote consultation was useful in specialties like ophthalmology, rheumatology, dermatology, and neurology. Also, it was suitable for minor health problem and follow-up visits. Although, it was not suitable for all patients and in all contexts. Moreover, the most common mode used for teleconsultations were phone and video call, text message, e-mail, Skype and

WhatsApp calls or message. The most concerns to use this technology were legal liability, safety, privacy, concerned about internet connections, loading up data or measurements, effectively convey patients' symptoms to the clinician, technical challenges, worries about difficult conversations, and lack patient centeredness.

**Conclusion:** In general, patients were highly satisfied with the use of remote consultation, and this could be a promise for the wider use of this technology in healthcare.

**Keywords:** Tele-medicine, Remote Consultation, Covid-۱۹



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## “Prototyping and Evaluating of Mobile Application Interface for Kidney Transplant Candidates in Waiting List”

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**Background:** Chronic kidney disease is becoming a major public health problem around the world. Transplantation is the preferred treatment option for end-stage renal disease. Waiting time to receive a transplant kidney for the most patients can be 3-5 years. These patients can manage difficulties arising during the transplantation process. They need educational, practical, and psychosocial support.

**Objectives:** This study aimed to design and evaluate a prototype of a mobile application interface for a kidney transplant in Waiting List Candidates.

**Materials and Methods:** This cross-sectional study was conducted in Montaserieh Hospital affiliated with Mashhad University of Medical Sciences in 2022. The current study was conducted in three following phases 1. Developing the Minimum Data Set (MDS) for kidney transplant patients, 2. Designing a prototype of a mobile user interface using Balsamiq software based on point of view of transplant and medical informatics specialists, and 3. Evaluating the interface with standardized questionnaire of Mobile App Rating Scale (MARS) and System Usability Scale (SUS).

**Results:** The proposed MDS comprised 11 categories and 170 data elements. The designed prototype encompassed three user interfaces as follows: patients, nurses, and physicians. The results of evaluating the quality and usability of the designed interface were acceptable. The average MARS and SUS scores respectively were 4 and 72.68.

**Conclusion:** Designing a monitoring system based on information technology as well as the effective use of mobile health services is an effective step in managing the condition of treatment and transplantation of kidney transplant patients.

**Keywords:** Mobile Health, Kidney transplant, Usability Evaluation



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**“Development of an assessment instrument to assess physicians' awareness of COVID-19 death certificate documentation and ICD-10 coding of the causes of death”**

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**Background:** At the beginning of the COVID-19 pandemic, WHO and the Iranian health ministry published guidelines for Death Certificate Documentation (DCD) and coded the causes of death in ICD-10. Public health policies depend on DCD which can provide vital statistics and contribute to the evaluation of a pandemic's evolution.

**Objectives:** In present study was carried out in order to design an evaluation tool to assess the awareness of physicians two years after COVID-19.

**Materials and Methods:** The developmental study was performed in three phases. 1- The WHO's guidelines for coding rules were independently translated into Persian 2- The translated version was approved by an English native expert, and divided by an expert panel team into closed and open questions and scenarios. 3- The CVI and CVR were assessed by expert coders (n=4), medical informatics (n=6), and physician (n=4).

**Results:** The 43 items instrument encompassed five sections that acquired CVI: 0.86, 0.80 and CVR: 0.93, 0.92. The instrument sections were as follows: 1- general DCD and ICD-10 for COVID-19 (n=7), 2- terminology of COVID-19 (n=1), 3- documentation COVID-19 disease history (n=7). 4-Evaluation of ability of the diagnosis of confirmed/suspected COVID-19 based Para clinical tests and clinical symptoms (n=20). 5- Documentation of COVID-19 death certificate based on the WHO's scenarios (n=10).

**Conclusion:** The results of this study provided a good basis to determining the knowledge of physicians about the death certificate documentation rules that can provide in future scientific.

**Keywords:** Documentation, Death Certificate, COVID-19, Awareness

## “A Quantitative Study on Completeness Rate of Death Certificates Documentation for COVID-۱۹ cases”

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**Background:** Death certificates are essential to provide valuable health information and help to guide local health policies and priorities. Completeness of information in the death certificates is critical to achieving correct statistical information, especially in general hospitals.

**Objectives:** The current study aimed to explore the completeness rate of death certificate documentation of COVID-۱۹ cases in a large teaching hospital.

**Materials and Methods:** The retrospective-descriptive study was conducted in a large teaching hospital affiliated with Mashhad University of Medical Sciences during the COVID-۱۹ epidemic in ۲۰۲۱. A ۴۲-item checklist was developed to evaluate the completeness rate of death certification of COVID-۱۹. The samples were chosen randomly and assessed by three trained staff via the checklist. The completeness rate of documentation was determined using descriptive statistics.

**Results:** Our results showed that ۳۸,۱۷% (n=۳۱۵) of death certifications of COVID-۱۹ had at least one documentation defect. The range of completeness rate in paper-based death certification was ۰,۶۳% (n=۲) to ۹۸,۷۳% (n=۳۱۱). The most documentation completeness rate belonged to “the first name of the patient” and “physician's seal and signature” items.

**Conclusion:** Our results showed that most COVID-۱۹ death certificates have documentation deficiencies. It seems to conduct regular evaluations and provide feedback to the health care providers, hold training courses, and develop punitive and incentive mechanisms that may improve death data and statistics.

**Keywords:** COVID-۱۹, Documentation, Death Certificates

## “Mobile health for indoor air quality monitoring affected to elderlies health”

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**Background:** The effect of the built environment on quality of life in older adults is particularly relevant since this age group spends more time at home in comparison to younger adults. Online monitoring for urgent intervention is important regarding to the elderlies health in built environment.

**Objectives:** The main aim of this study is review of mobile health application for indoor air quality monitoring affected to elderlies health.

**Materials and Methods:** In this systematic review, updated article were searched using the resources available in valid databases such as PubMed, Scopus, Web of Science (WOS), Science Direct, and Google Scholar. The search strategy was based on a combination of following these concepts: mobile health (m-health), Environment health determinants, Elderlies.

**Results:** A crucial issue for the sustainability of societies is how to maintain health and functioning in older people. Older adults are recognized as vulnerable populations and are at a greater risk of exposure to indoor air pollutants. Due to physiological changes associated with aging that can alter their degree of susceptibility; existence of chronic diseases and the use of medications to treat those conditions; changes in activities and lifestyles that can alter the types and amounts of contaminants exposed to. Online monitoring of these environmental risk factors is essential for early warning and self-care interventions. Mobile technology can be useful for this important.

**Conclusion:** Efforts have been made to develop mobile based technologies to alleviate such conditions that it should be considered in smart building.

**Keywords:** Mobile health, Environment health determinants, Elderlies

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## “A systematized review of smartphone applications to improve self-management in patients with celiac disease”

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**Background:** Effective self-management skills for a gluten-free diet in celiac disease are essential to managing the health condition. In recent years, Mobile health has been found to be useful in chronic diseases management such as celiac.

**Objectives:** This study aimed to review smartphone applications to improve self-management in patients with celiac disease.

**Materials and Methods:** This article was a systematic review. Related papers were searched using various databases, including Web of Science, PubMed, Scopus, and Science Direct. The time frame was between January 2010 and August 2022. 300 articles were found. In order to determine the eligible articles, two reviewers independently reviewed the titles, keywords, abstracts and full text of the identified sources. Finally, 20 papers were included in the study.

**Results:** The results showed that the smartphone applications to improve self-management in patients with celiac disease were more effective than routine clinic

education in relieving indigestion symptoms. These applications are used in three different ways: Follow up on diet, monitoring symptoms and content of the meal plan.

**Conclusion:** So far, various applications have been designed to improve the lifestyle of celiac patients. They are affordable, convenient, accessible and customizable, and can be performed without the help of a healthcare professional.

**Keywords:** Celiac Disease, Self-management, Smartphone, Mobile Applications



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## “An Intelligence Clinical Decision Support System for Premature Newborns: A Multi Agent Approach”

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**Background:** Low birth weight is one of the most important indicators of community health of infant mortality. It seems that identifying the factors associated with the disease, prevention and management, help to reduce the birth of premature infants and its complications.

**Objectives:** This study aimed to present an intelligence CDSS for premature newborns, based on a multi agent approach.

**Materials and Methods:** The present study was a developmental study was conducted in ۱۴۰۰ in several stages. First of all, a systematic review and semi-structured interviews with using by Delphi model was conducted to determining the MDS. Then for user interacts, UML diagrams were drawn using Microsoft Visio software, and the system was developed. Finally, users' views on the usability of the system were evaluated with QUIS and SUMI questionnaire.

**Results:** Findings included ۲۳۳ essential data elements in two main groups of essential data for mother=۱۰۷ and infant=۱۲۶ elements. The reliability of the

questionnaire with Cronbach's alpha was 0,938 for the mother and 0,910 for the infant questionnaire. Using the C # programming language, the program was created in the .NET 4,0 technology platform and the system were evaluated by the end user from the point of view 92,73% in SUMI and 7,97% with QUIS.

**Conclusion:** Due to the high prevalence of preterm birth in Iran and the economic burden, management health care is essential. The results of this research can be useful as a comprehensive model for presentation of all systems related to health.

**Keywords:** Prematurity, Information management, CDSS, Artificial Intelligence, Evaluation.

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## “Improving the function of Alzheimer’s patient with virtual reality: a review study”

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**Background:** Alzheimer's disease is a serious neurological disease that negatively affects the patient's behavior, cognition and memory. Virtual reality (VR) technology considers as a smart tool that may affect the emotions of patients by simulating the real world.

**Objectives:** The purpose of this study was to investigate the solutions of virtual reality to improve the performance of Alzheimer's patients.

**Materials and Methods:** This review study was conducted in 2022 with the keywords of “virtual reality”, “performance” and “Alzheimer\*” with “AND” and “OR” connectors in the period of 2021-2022. In this study, 39 articles



were found from the PubMed database, and three articles from the Google Scholar database in manual search. After the first screening, ١٠ studies were selected in the title and abstract, and finally, ١١ studies were included in the research.

**Results:** The findings indicate that virtual reality is an effective treatment for Alzheimer's patients. For Alzheimer's treatment, tools like music therapy, aromatherapy, rhythmic stimulation, phototherapy, and etc. used. The virtual zoo had a positive effect on reducing negative emotions. Spatial navigation, visual signals, environmental interventions such as rehabilitation, cognitive and educational stimulation to improve cognitive function and reduce dementia are the most common methods of virtual reality treatment.

**Conclusion:** The use of virtual reality and therapeutic methods that can improve spatial visual abilities, mood and useful interventions for retrieving memories and cognition, are not available for all sections of the society. But by promoting effective methods, this platform can be used to prevent the progression of the disease.

**Keywords:** Virtual Reality, Alzheimer's, Cognitive Impairment, Information Technology, Functionality.

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## “Virtual reality: A new opportunity to confronting with insect phobia”

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**Background:** Today, phobia is one of the most important psychological problems as excessive fear. One of the famous types of phobias is insect phobia. Advancement of technology, can be helpfull in the treatment, and identification of psychological problems.

**Objectives:** The purpose of this research was to investigate the opportunities of virtual reality in insect phobia.

**Materials and Methods:** This review study was conducted in 2022 by searching the "virtual reality", "phobia" and "insects" in PubMed and Scopus in 2018-2022.

Out of 200 studies were found by inclusion criteria, after the final screening 20 articles, 12 completely related articles were included in the study.

**Results:** The findings indicated that from the set of 12 studies, the findings of 9 articles on insect phobia were related to the morbid fear of spiders. Virtual reality has a fluctuation effect (decreasing or increasing) on the patient's condition and feelings. Also, the studies were representative of the software that remotely enters the patient and the therapist into a common VR environment and the treatment procedure was performed. Teaching students refers to the use of VR in phobias. According to the studies, virtual reality causes the traumatic memories of the past be simulated and diverts the patient from it.

**Conclusion:** It seems that VR is one of the most effective treatment methods for insect phobia, which over time reduces anxiety, increases self-confidence, and stimulates nerves and brain cells. This tool can be used to treat mental patients in other areas such as crowd phobia, touching, etc.

**Keywords:** Virtual Reality, Insects, Phobia, Health Information, Technology.

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## “Brain Aneurysm Surgery: Application of virtual reality technology”

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**Background:** Cerebral aneurysm is a weak or thinned area in the wall of cerebral arteries. In recent years, health technologies such as virtual reality, block chain, and mobile health have played a great role in the prevention, and treatment of patients.

**Objectives:** The aim was to investigate the use of virtual reality technology in brain aneurysm surgery.

**Materials and Methods:** This research is a review study that was conducted in the period of 2021-2022 in the "PubMed" database with the keywords "virtual reality", "surgery", "cerebral aneurysm" using communication "AND" was performed. Twelve studies were found in this search, and 4 studies were selected in the manual

search in the "google scholar" database in the mentioned time period with the mentioned keywords. In total, ۱۳ of these studies were included in the research.

**Results:** The findings indicate that ۴ studies focused on the training of doctors, one for patients, three for evaluation of virtual reality simulators, one related to comparison of real and virtual reality by health care providers, and other mention the effect of VR simulators.

**Conclusion:** Based on the conducted studies, it can be acknowledged that the surgical simulator has the possibility of treating complex aneurysmal anomalies in children and reducing the complications of treating unruptured intracranial aneurysms, improving surgery, and performance scores. Doctors have provided a better understanding of the patient's anatomy. It is suggested to investigate simulation tools in future studies to improve the health level of patients with aneurysm.

**Keywords:** Virtual Reality, Brain Aneurysm, Information Technology, Technology, Simulator.

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## “Classification and content evaluation of application in the field of organ transplantation: A systematic review”

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**Background:** Electronic health applications meet the needs of patients in self-care by providing continuous providing access to appropriate instructions. Personalization of these applications has a great impact on their efficiency. Therefore, this study conducted with the aim of classifying and evaluating the content of applications in the field of organ transplantation.

**Objectives:** The aim of this research was to investigate the use of virtual reality technology in brain aneurysm surgery.

**Materials and Methods:** This review was conducted in 2022 by searching for the keywords transplant, application and organ in Google Play without any time limit.

In this search, 44 applications were found, after removing duplicate cases (4 cases) from 69 applications in screening stage, 16 applications were included in this study.

**Results:** Studies showed among 16 apps found; educational application (6), examination of the patient before and after transplantation (3), creation of interaction between donor and recipients and specialists (4) and also 1 app for obtaining consent for organ donation, 1 application dedicated to hair transplant, which was not included in this study. 4 applications were specifically related to organ transplantation. The applications found were kidney (1), kidney and pancreas (1), brain and bone (1), lung (1), liver (3), blood and cell therapy (1), and one case was specific to stem cell transplantation.

**Conclusion:** The usage of information technology has long been considered in the field of medicine. Nowadays, many people want to use applications. Customizing applications in design can provide answers to many patients' questions and improve their health.

**Keywords:** Application, new technologies, classification, systematic review, organ transplants.

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## “Usability of virtual reality in children with autism”

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**Background:** Today, technology is used to improve the quality of life of patients in the field of mental health. Children and adults with autism use smart phones, games, and tools installed on iPad, talking software to convey the concept and increase the power of speech.

**Objectives:** This study was conducted with the aim for usability assess of virtual reality in improving the health of children with autism.



**Materials and Methods:** This review study was conducted in 2022 by searching for the keywords "Virtual Reality" and "Autism" in the PubMed and Google Scholar databases for the period 2021-2022. In this study, 98 articles were found, after the first screening, 20 articles were selected and finally 14 articles were included in this study.

**Result:** In 14 reviewed articles, it is indicated that children with Autism Disorder (ASD) are exposed to an increase in environmental damage errors. Teaching safety skills from a natural or simulated environment using virtual reality can create a structure for repeated learning opportunities in a homogeneous environment. Research shows that virtual reality is cost-effective and has a sense of motivation for safe, controlled learning and increasing skills. Also, using VR tools can reduce pain.

**Conclusion:** The compensatory role for disability rehabilitation through assistive technology such as video modeling, virtual reality, image exchange communication system, and humanoid robot is the main factor in explaining the use of assistive technology for autism spectrum disorder. It is necessary to design technology programs in the fields of disabilities and effectiveness for autism spectrum disorder.

**Keywords:** Virtual Reality, Autism, Skills Training, Control, Children.

## “Artificial Intelligence challenges in medical Image processing”

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**Introduction:** Artificial intelligence can be considered as the next step in the technological world revolution. Artificial intelligence and field of image processing will cause tremendous growth in the accuracy of pictures and can help us greatly in examination, treatment, and even medical research.

**Objective:** This field just like of all technology fields is made up of various challenges and ups and downs paths, and the present study examines the general challenges of this field.

**Materials and Methods:** This study conducted in 2022 by searching in PubMed, WoS, Wiley Online Library with the keywords "Image processing", "Artificial intelligence", and "Challenges". A three-year limitation imposed. Article sources

reviewed, and duplicate were removed using EndNote 20. Abstracts reviewed by researchers (20 articles) and 6 were included.

**Results:** Findings showed the challenges of medical imaging in artificial intelligence are divided into five areas: Medical image data (data recognition difficulty, human dependence, manual data recording, transparency and correct structure lack, low quality); Algorithms (lack of correct algorithm, inaccuracy, validation and evaluation, generalizability and focus, limited image processing techniques, training complexities); privacy (security, metadata, hiddenness, costliness, data governance, accessibility, integrity); hardware (limited processing equipment); Management (obstacles at the macro level of management, interoperability, organizational barriers, stakeholder policies for use).

**Conclusion:** The effectiveness of artificial intelligence in image processing is not hidden to anyone. It is suggested to be more careful in the design and selection of algorithms so that it can provide the best results and functionality with the existing hardware.

**Keywords:** Artificial intelligence, challenges, image processing, obstacles.

## “The Role of Teleconsultation in The Control of The Covid-19 Pandemic Crisis Management”

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**Introduction:** With the spread of COVID-19 all over the world, continuing face-to-face consultations has become too risky for both the patients and the doctors. Teleconsultation as an alternative method can be an effective solution to prevent possible risks.

**Objective:** The purpose of this study is to investigate the role of Teleconsultation in controlling the crisis of the Covid-19 pandemic.

**Method:** This review study was done in 2022 by searching reputable databases such as PubMed and Google Scholar search engine with the keywords "Teleconsultation", "Covid-19", "Disaster Management" and "Opportunities" with a time limit of three years. After removing duplicate records with EndNote

software<sup>5</sup>, the title and abstract of the articles were reviewed by the researchers and the articles that met the inclusion criteria were included in the study. Finally,<sup>19</sup> articles were remained and 9 articles were selected to review the full text.

**Results:** Review of studies shows that teleconsultation provides various services in a way that improves conditions in 3 areas by making digital communication between specialists and patients: 1-Management (Reducing the burden on healthcare centers and allows efficient use of manpower) 2-Clinical (Exchanging services during quarantine, saving time) 3-Security (Secure exchange of information by using technologies e.g., block chain).

**Conclusion:** The use of teleconsultation can be a basic solution to providing special conditions in crises where face-to-face consultation is challenging or access is limited Also, by developing this solution and combining it with other technologies e.g., Metaverse, many possible challenges can be solved.

**Keywords:** Teleconsultation, covid-19, disaster management, opportunities, Technology.

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## “The role of information technology in tracking patients with covid-19”

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**Background:** During the covid-19 pandemic (the global crisis), the presence of information technology (IT) by tracking corona patients in healthcare systems in order to prevent further spread and improve its effects.

**Objectives:** The purpose of this study is to determine the role of IT in tracking patients with Covid-19.

**Materials and Methods:** This review study was conducted in 2022 by searching the keywords "Technology", "Tracking" and "Covid-19" in the PubMed, WoS, Science Direct and Google Scholar in 2019 to 2022. The sources of the articles were checked to ensure the completeness of the search results and duplicate titles were removed with the help of EndNote software.

**Results:** In this study, the title and abstract of 20 articles were selected by the researchers and finally 9 articles included in this study according to the inclusion

criteria. According to studies, IT collects primary data and information related to corona patients (EHRs, clinical trials, et cetera) with the help of Surveillance Systems, artificial intelligence, IoT, telemedicine, GIS, web-based services, etc. Analyzing, managing and finally sharing them among health staff helps in facilitating the tracking of patients.

**Conclusion:** If the necessary infrastructure and financial support of the government is provided for the IT field, IT-based health systems and programs can track these people more accurately, faster and better by using primary data and information of patients and have a tremendous and positive effect in the process of prevention, diagnosis, save time and health costs and finally have the complete eradication of this illness.

**Keywords:** Teleconsultation, covid-۱۹, disaster management, opportunities, Technology.

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## “Self-care efficacy: Experiences of women receiving mhealth-supported antenatal care during the corona pandemic”

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**Background:** To protect pregnant mothers from infection during the COVID pandemic, health care providers turned to mHealth to provide as much prenatal care as possible.

**Objectives:** This survey was conducted to evaluate mother's experience with a prenatal m-health care and identify benefit to accessing mHealth among urban and rural pregnant mothers in Qom province during of the COVID-19 pandemic.

**Materials and Methods:** Due to the COVID-19 pandemic, on July, 2020, in-mother routine prenatal care was abruptly converted to a hybrid model at health care. Approximately half of routine visits were scheduled via mHealth utilizing either audio-only platforms through cell phones or landlines. In-person visits were planned only with high risk pregnant mothers. A qualitative study using semi structured interviews was conducted of 12 pregnant mother who had successfully participated in a mHealth visit with a midwifery provider early in the course of the COVID-19 pandemic

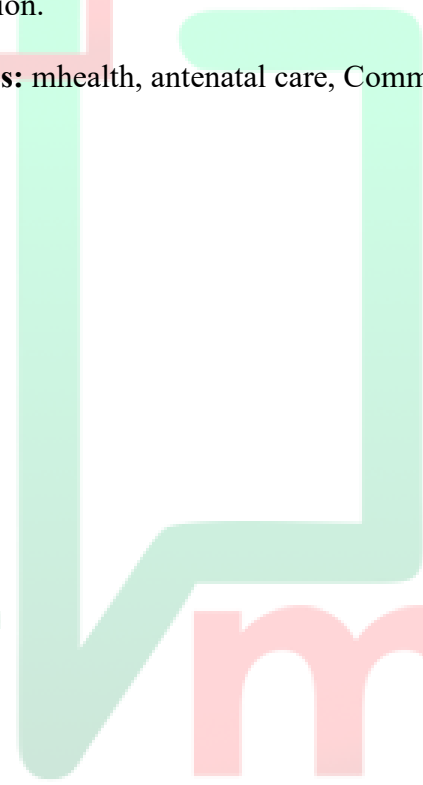


**Results:** Three main themes and ten sub-themes affecting access to healthcare services were identified: Virtual care (phone visit, telephone follow-up , continuity of care at home), Self-care efficacy (mother engagement, encourage self-help skills, the ability of self-care), The Cost Effectiveness of Prenatal Care (cost reduction health care, reduce unnecessary procedure, time saving) was achieved.

**Conclusion:** As our findings show, there was a strong benefit with respect to interoperability in mHealth. Health systems should recognize that mHealth can only fulfill its promise if all mothers pregnant have fair access to the tools necessary for participation.

**Keywords:** mhealth, antenatal care, Community health workers, corona pandemic

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## “Diagnosing patients with pulmonary tuberculosis by processing chest X-ray images using deep learning”

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**Background:** Tuberculosis (TB) is a major global health threat. It is a chronic lung disease caused by a bacterium called Mycobacterium tuberculosis. Fortunately, it can be well treated by antimicrobial drugs. Early diagnosis of tuberculosis can help with treatment and consequent administration of proper medication. Chest X-rays (CXR) are commonly used for detection and screening of pulmonary. The advent of new powerful algorithms such as deep learning has triggered attempts to develop computer-aided diagnostic systems for TB detection.

**Objectives:** In this paper a deep learning model is proposed for detecting TB by analyzing chest X-rays.

**Materials and Methods:** A convolutional neural network (CNN) deep learning model is proposed and adjusted to distinguish healthy and infected images. X-ray images in this research have been collected by Shenzhen No.3 Hospital in Shenzhen, China. The dataset is randomly divided to train and test portions.

**Results:** The model can achieve detection accuracies between 97%-100% in different runs.

**Conclusion:** A deep learning model for detecting TB using chest X-rays is proposed. To evaluate it, the dataset is divided to train and test randomly. Results implies its excellent ability in separating TB infected cases from healthy ones.

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**Keywords:** Tuberculosis (TB), X-ray, Deep learning, image processing



## “Social media in the COVID-19 pandemic, a systematic review of the literature”

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**Background:** Social media plays an important role in people's views and attitude in life, especially in times of crisis

**Objectives:** The purpose of this study was to systematically review the impact of social media in the era of the COVID-19 pandemic.

**Materials and Methods:** Databases including Medline, Scopus, Science Direct, Embase, PubMed Central and Google Scholar were searched using relevant keywords. Methodological evaluation of the quality of the selected studies was done using the PRISMA scale.

**Results:** A total of 46 articles were included in this review. Surveys show that social media has been used for sharing views, health care and distance education during the Covid-19 pandemic. Twitter, Facebook, YouTube and Instagram are among the most frequently used social media, worldwide. Local platforms were superior in some countries such as China. Most of the content in the social media

was related to the analysis of the disease, the methods of prevention, the origin of the disease and the government's plans to control the disease. The role of social media in people education on issues such as mental health improvement during pandemic and disease prevention was another important point of the findings.

**Conclusion:** Based on the results of the current study, governments and experts can use the experiences of application of social media during Covid-19 pandemic as an efficient tool in dealing with future epidemics.

**Keywords:** COVID-19, Social Media, Mass Media, Systematic Review



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## “Design and evaluation of mobile-based tele dermatology system for diagnosis of skin lesions”

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**Background:** Telemedicine refers to the use of information technology to transfer medical data and provide medical, counseling, diagnosis, treatment, and patient education services with the help of audiovisual systems. A common and important application of telemedicine is the diagnosis and treatment of skin diseases. Using telemedicine systems, dermatologists can advise other health professionals or provide their services directly to patients. This application of telemedicine is known as tele dermatology.

**Objective:** This study aimed to investigate diagnostic concordance between tele dermatological assessments of skin lesions based on images and clinical data collected via mobile phone and the assessments made through in-person examinations.

**Materials and Methods:** The research was conducted in three phases: MDS design, application design, and evaluation. The information and images of 67 patients were registered in the application. The data were analyzed in SPSS using

descriptive statistics .Patients were examined once in person by a dermatologist and another time remotely by another dermatologist who was given the clinical data and images captured by mobile phone. Diagnostic concordance between in-person and teledermatological assessments was determined.

**Results:** After analyzing the data of 67 patients, diagnostic concordance between in-person assessments and teledermatological evaluations was measured in using of Kappa coefficient.

**Conclusion:** Teledermatology via smartphones can serve as an easy method for the preliminary diagnosis of skin lesions. Our experience indicates that the smartphone app can help dermatologists and other physicians avoid many of the routine consultations on skin lesions.

**Keywords:** smartphone, Mobile app, Teledermatology, skin lesions.

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## “The use of smartphones to access information resources: From radiology residents' perspective”

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**Background:** Increasingly high-resolution smartphone cameras along with portability, accessibility, built-in Internet connectivity and social media access have made them a useful device for radiologists.

**Objectives:** This study aimed to evaluate the use of smartphones in the Radiology Department at Shahid Beheshti Hospital in Kashan, Iran.

**Materials and Methods:** This cross-sectional study was conducted in Kashan, Iran in ٢٠٢٢. Using the census method, ١٦ radiology residents were selected as the study population. The data collection tool was a researcher-made



questionnaire containing 17 questions on the demographic information and use of smartphones to access radiology information resources. Data were analyzed using descriptive statistics through SPSS.

**Results:** Of the 16 participants, 9 (56.3%) were female. Participants' mean age was  $30.0 \pm 4.38$  years. The majority of the radiology residents had Android Operating System (81.3%). More than half of the smartphone users (56.3%) thought that there were enough radiology related applications. "Radiopedia" (18.8%), "PACS" (18.8%), and "Radiology assistant" (12.5%) were the most utilized applications. Six of the participants (37.5%) "always" used smartphone Internet to seek radiology-related information. Two most common ways to obtain radiology information on the Internet were using search engines such as Google (70%) and specialized websites such as Radiopaedia.org (56.3%). Social media usages were as follows: WhatsApp (70%), Instagram (70%), LinkedIn (0%).

**Conclusion:** Since social media and mobile applications are often used and widely accepted by radiology residents in their workplace, more studies are needed to evaluate the quality of radiology-related information in these media.

**Keywords:** Smartphone, Mobile Applications, Radiology Department

## “Improving Parents’ knowledge, Attitude and Behavior about ADHD: An Investigation on the Role of a Psychoeducational Intervention”

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**Background:** Knowledge and attitude of parents about attention deficit/hyperactivity disorder (ADHD) is an important factor in management of the disorder in children. So, parent education is essential for preventing impulsive behaviors and hyperactivity. Therefore, the present study aims improving parents’ knowledge, attitude, and behavior about ADHD: An investigation on the role of a psychoeducational intervention.

**Materials and Methods:** The multi-stage cluster sampling method was used in this study. The study population includes 72 parents of primary school students with ADHD in region 3 of Isfahan in 2020. The participants were randomly assigned to two groups (36 participants in each group). Data collecting tools included a demographic questionnaire and a standardized questionnaire to measure parents’

knowledge, attitude, and behavior. There were 10 training sessions conducted for parents consisting of lectures, questions and answers, and role-playing methods.

**Results:** The age range of the participants was 6 to 12 years old. Intergroup analysis of variance (with adjusting scores before the intervention) for parents showed that 2 months after the intervention, the value of knowledge, attitude, and behavior of parents was significantly higher than the control group ( $p < 0.001$ ).

**Conclusion:** The study showed that parent education is effective in improving knowledge, attitude, and practices towards ADHD children. So, it is recommended to conduct further studies on educational intervention programs to examine the knowledge of parents' attitudes and practices in other populations. Also, Educational interventions should aim at improving knowledge, attitudes, and behavior, and should be evaluated in terms of their long-term effect.

**Key words:** ADHD, Parents, Knowledge, Attitude, Behavior, Educational Intervention.

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## “Identifying the Infrastructure Requirements of an IoT-Based Smart Health Monitoring System for COVID-19 Patients: a Systematic Review”

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**Background:** The emergence of coronavirus has led to unprecedented burden on the healthcare system. monitor early symptoms COVID-19 patients is crucial. The internet of things (IoT) is solution to combat this pandemic. IoT enabled healthcare system is helpful for monitoring of COVID-19 patients.

**Objectives:** determine the infrastructure requirements of tele-monitoring systems based IoT to monitoring of COVID-19 patients.

**Materials and Methods:** A systematic search was performed on IEEE, Scopus, PubMed from January 2020 to September 2022. This study was using of keywords and MeSH terms terms associated with COVID-19 and IoT.

The inclusion criteria were studies using IoT technology and measured the vital parameters and symptoms of COVID-19. Exclusion criteria were studies, did not use sensors or monitoring device.

**Results:** Searching scientific databases, 86 articles were included in the study with evaluation of the articles. We found that body temperature and heart rate sensors were the most used with 83% and 38%, respectively. Sensors blood oxygen level, respiratory rate, cough rate, blood pressure are used in (32%), (18%), (10%), (13%) of the systems, respectively. in (41%) of the systems, machine learning algorithms have been used as decision making modules, and (30%) used the Python environment.

**Conclusion:** Considering that fever is the most frequent symptom in patients with COVID-19, body temperature sensors were the most widely used. In addition, most of systems used mobile phones as the end-user device. For improved decision-making is recommended to integrate the machine learning modules.

**Keywords:** internet of things, Artificial Intelligence, COVID-19, Tele-monitoring, Mobile Health

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## “Artificial Intelligence and Nutritional Status”

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**Background:** Health and well-being may be affected by foods consumed as part of a diet. Following a nutritious diet throughout life can prevent malnutrition in all its forms and various non-communicable diseases (NCDs) and conditions. As a result, identifying dietary factors affecting health is of paramount importance. It is necessary to use the findings and achievements of other sciences to change global food consumption patterns. Artificial intelligence-based technology is one of them.

**Objectives:** This scoping review study was conducted to explore the potential applications of artificial intelligence in health-related nutrition conditions.

**Materials and Methods:** In this study, Scopus, and PubMed databases were searched in the period 2000-2022 with keywords related to nutrition and artificial

intelligence. Then, included studies were independently evaluated for eligibility by two reviewers who demonstrated good interrater reliability.

**Results:** The research revealed that innovative dietary assessment tools based on AI that utilize different sensors, software, or image/voice-based approaches had improved health outcomes in line with technological advancements.

**Conclusion:** As this review of successful experiences indicates, artificial intelligence and big data are a boon to the goal of preventing and control of nutrition-related diseases as they enable us to achieve our goals more efficiently.

**Keywords:** Artificial Intelligence, Diet, Nutritional Status

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## “The role of social networks in the training of nurses to deal with Covid-۱۹”

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**Background:** Nurses need the information to perform their duties in different places, especially during the covid-۱۹ outbreak, and this information is obtained from various sources. One of these sources was social networks.

**Objective:** The main purpose of this study was examined the role of social networks in the training of nurses to deal with Covid-۱۹.

**Materials and methods:** It is a cross-sectional study. The samples were collected by publishing the link to the electronic questionnaire on social networks. Inclusion criteria for the study included nurses who had experience working in the clinical



environment in teaching hospitals in Kerman during the Covid-19 pandemic, having a mobile phone, and being a member of one of the social networks. The data collection tool was a researcher-made questionnaire containing 36 questions and three sections.

**Results:** A total of 401 questionnaires were completed. More than 90% of the participants were women. In total, the impact of social networks in the training of nurses was average (Mean=2.80, Sd=0.99). The participants believed that social networks have the greatest impact on teaching hospital waste disposal, monitoring the condition of patients with Covid-19, and informing other departments and services for Covid-19 or suspected patients and it has the least impact on teaching stress management in the workplace and personal protection training.

**Conclusion:** The results of this study showed that social networks can play an effective role in the training of nurses. By providing the right information based on the needs of nurses when providing services, the anxiety of nurses can be reduced.

**Keywords:** Social network, Nurses, Covid-19.

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## “Educational intervention of parents and teachers for children with attention deficit hyperactivity disorder”

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**Background:** Educating parents and teachers is very important in managing child behavior, so the present study investigates the effect of parent-teacher educational intervention on reducing ADHD symptoms in children.

**Method:** Seventy-two children and their parents and teachers participated in this study. They were selected using the multistage cluster sampling method and randomly divided into two groups of test and control. Data collected by CSI-4 questionnaire and researcher-made questionnaires (knowledge, attitude, practice) of parents and teachers. Parents and teacher in test group participated in training sessions. Student's ADHD symptoms were assessed before and after the educational intervention.

**Results:** Two months after the intervention, based on parent and teacher report, the ADHD symptoms was decreased significantly only in test group students. Also, the score of knowledge, attitude and practice of parents and teachers 2 months after the intervention was significantly higher than the control group.

**Conclusion:** parents and teachers training and developing appropriate strategies to increase their awareness, attitude and practice can diminish ADHD symptoms in all three aspects including inattention and reduce the side effects of ADHD. Planning in educating parents and teacher is essential to prevent impulsive and hyperactive behaviors.

**Key words:** Attention Deficit Hyperactivity Disorder, Teachers, Parents, education, Intervention, student, Iran



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## “Food recommender systems for diabetic patients: A systematic literature review”

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**Background:** As a prevalent metabolic disease, diabetes has many side effects. One of the ways to manage this disease is to improve the lifestyle and modify the diet of the patients. The use of mobile applications for diet and weight management is increasing.

**Objective:** This study aimed to review the literature about food recommender systems for diabetic patients developed by mobile applications.

**Materials and methods:** This systematic review was conducted according to PRISMA standards. We searched PubMed, Scopus, WoS with the keywords such as “Diabetes” and “recommender system” and “mobile application” for the relevant papers published until March 2023. Two independent authors reviewed the titles and abstracts based on the inclusion and exclusion criteria. The same authors independently reviewed the full text of the papers to identify the relevant studies.

**Results:** 12 out of 1700 studies were included in this study. Only one study focused on type 1 diabetes. Two studies performed on type 2 diabetes. Other studies focused on all types of diabetes. Two studies conducted a randomized control trial and a

cohort study. Other studies developed a system. They did not evaluate their systems in the real environment.

**Conclusion:** The results of this study showed that food recommender systems can play an effective role in helping diabetic patients to take healthier diets which leads to a better lifestyle.

**Keywords:** Food recommender system, Diabetes, Systematic literature review.



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## “Validity and reliability of digital-based dietary assessment questionnaires: a Systematic Review”

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**Background:** The nutrition care process starts with a dietary assessment (DA). With new developments in Telemedicine and mHealth, digital DA questionnaires are available, but their validity and reliability are issues to address.

**Objectives:** We aimed to systematically review publications assessing the validity and reliability of digital DA questionnaires.

**Materials and Methods:** PubMed and Web of Science were searched for studies published up to the end of November 2022. The search was conducted using MeSH and non-MeSH keywords related to "dietary assessment", "web-based", and "validity" and their combination to find relevant papers. Two independent

investigators screened the search results. General characteristics of the eligible studies as well as the results related to validity, reliability, and reproducibility were extracted.

**Results:** The search led to 12 eligible studies examining digital forms of DA questionnaires accessible through web pages, mobile, or computer applications. Food Frequency Questionnaire, food record, and 24-hour food-recall were evaluated and validated in various languages, ages, ethnic groups, and different clinical conditions. Moreover, questionnaires were designed and validated to assess overall diet, energy intake, or specific food items or nutrients including vegetables, n-3 fatty acids, phytoestrogens, carotenoids, zinc, iron, and vitamins. In addition, some questionnaires provided graphical items to achieve a better understanding of the online respondent.

**Conclusion:** Online DA questionnaires have acceptable validity and reliability. Adding features such as graphic images increases this validity. Future studies are needed to assess these digital questionnaires in the Iranian population to help develop online research and clinical practices via mHealth approaches.

**Keywords:** Dietary assessment, Validity, mHealth, web-based, Systematic review.

## “ Local Fuzzy Clustering: A New model to Improve Detection of Breast Region in Thermography Cancer Monitoring”

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**Background:** A challenging step in breast thermography for detecting cancer is to extract the breast region and remove the rest of the tissues in order to increase the accuracy of the final decision. Unfortunately, the performance of this procedure is hampered by low contrast of thermograms.

**Objectives:** The aim of this article is promoting fuzzy concept in order to local modeling of the pixels in a breast thermogram. By applying the fuzzy rules on contrast and lowpass filtered versions of thermogram, each pixel of the image is scored as either low, medium or high. Then the extracted edges of the fuzzy processed thermogram indicate the region of breast.

**Materials and Methods:** The proposed algorithm was applied to a DMR-IR well known breast thermography dataset including thermal images which have been captured with two static and dynamic protocols. The method implemented in Tensorflow framework as a machine learning library in Python in Google Colab (i.e., a GPU framework provided by Google) testbed.

**Results:** The proposed local fuzzy scheme reached to MSE, PSNR and Jaccard similarity coefficient of 0.0015, 29.08 and 0.9399 in detecting breast. These values



show significant improvement in performance compared to results of basic fuzzy method which led to ۰,۰۰۳۸, ۲۴,۷۷ and ۰,۹۰, for above parameters respectively.

**Conclusion:** Improving the performance criteria in proposed local fuzzy method shows that it may be considered as a candidate for use in future researches related to the detection of breast cancer in thermography systems.

**Keywords:** Breast Cancer, Thermography, Fuzzy Logic, Detection.



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## “Mobile Health Technology for Monitoring and Management of Inflammatory Bowel Disease: a systematic review of technical aspects”

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**Background:** Inflammatory bowel disease (IBD) is gastrointestinal disorder that is chronic, and debilitating, and diminishes the quality of life. In recent years, with a better understanding of the pathophysiology of the disease, as well as advances in mobile health technology, we have had new strategies in the management of IBD.

**Objectives:** This study aimed to summarize the technical aspects of using mobile health in IBD patients.

**Materials and Methods:** The study protocol adopted the PRISMA guidelines. A systematic review was performed using PubMed, Web of science and Scopus to identify articles using Mhealth Technologies in English literature and published from 2010 to 2022. Based on the predefined selection criteria, 2 levels of screening were performed.

**Results:** We retrieved 197 potential articles were from the 3 databases. After 2 levels of screening, only 12 articles that met our inclusion criteria were identified.

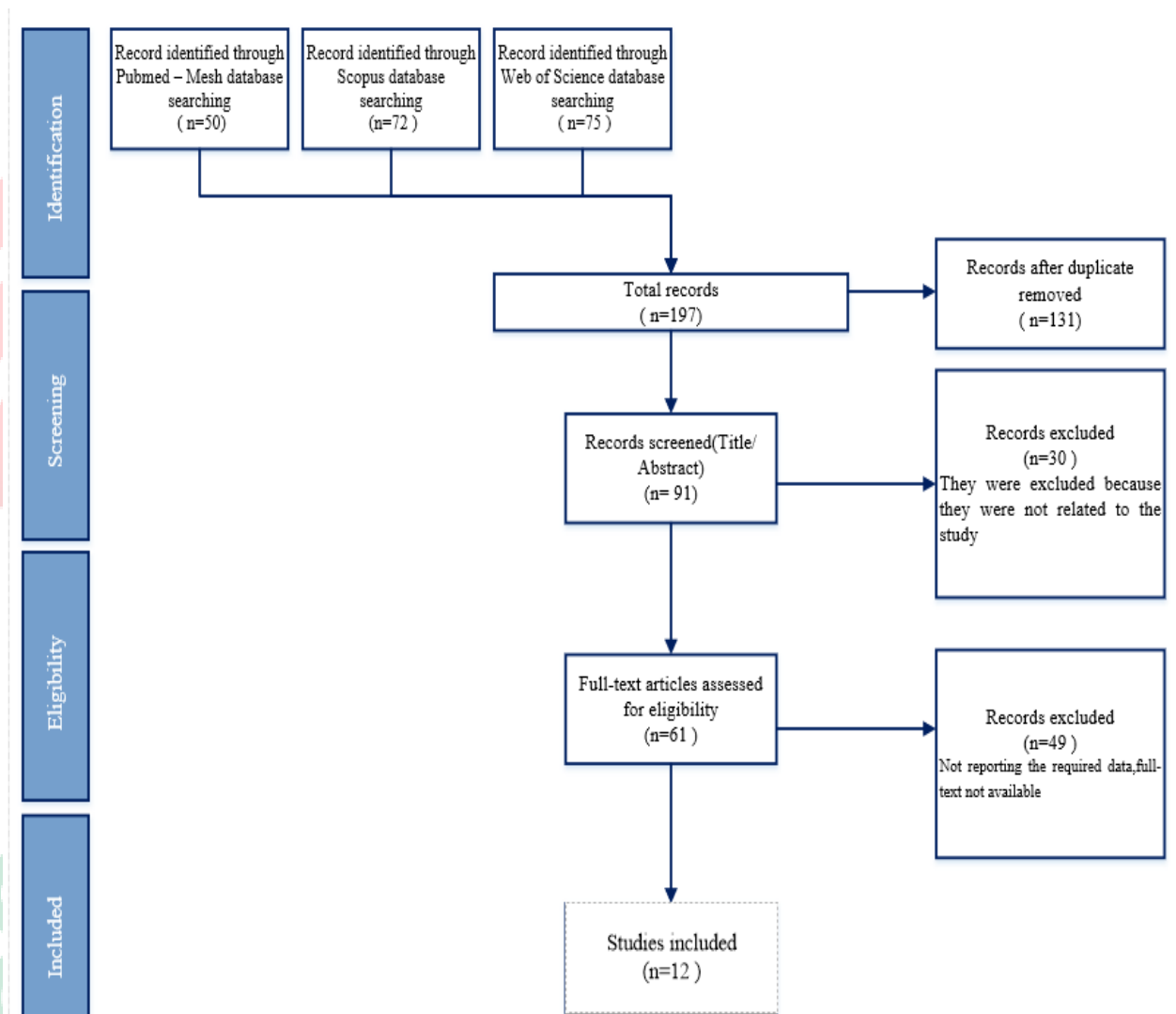
The findings indicate that Applications have been designed with different purposes, including education, treatments, disease control, monitoring, communication between patients and healthcare providers, and improved health outcomes. In 9 (70%) studies Mobile apps developed in two formats (web-based and mobile-based), and only 3 (20%) studies have integrated with electronic health records. In 10 studies (84%), Applications have been evaluated from different aspects, including usability, accuracy, feasibility, satisfaction, and effectiveness.

**Conclusion:** Mobile health technologies can improve quality of life, quality of care and self-management in IBD patients. Future studies and app design for IBD should include integration and interoperability of mobile apps with EHRs..

**Keywords:** inflammatory bowel disease, IBD, Mobile health, smartphone

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## “Obstructive sleep apnea detection based on smartphone and ARM microcontroller”

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**Background:** High quality sleep is essential for a healthy life. So, it is important to diagnose sleep disorders precisely as a prerequisite for treatment. Obstructive sleep apnea is a common sleep disorder.

**Objectives:** In this study a portable and cost-effective hardware and computationally efficient algorithm is proposed for obstructive sleep apnea detection in combination with smartphone as monitoring device.

**Materials and Methods:** Obstructive sleep apnea occurs when throat muscles intermittently relax and block airway during sleep, leading changes in blood oxygen levels, sound of breathing and rhythm of chest movement. In this study focus is on these three clues. An electronic module (max30100) is used to measure blood oxygen level, accelerometer (MPU9250) to measure chest movements and a microphone to analyze breathing sound. The algorithm is implemented on ARM microcontroller (STM32F407). Results are sent to android smartphone through Bluetooth for monitoring. Oxygen level drop points are considered as starting points. Sound and acceleration data is processed 10 seconds before and after these

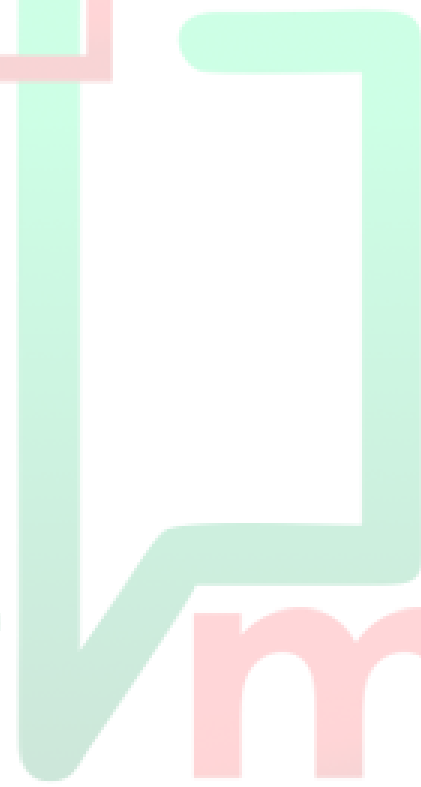
points. Energy of sound signal is calculated in this period and existence of abnormal peak is checked. In accelerometer data, after normalization, number of zero crossing points is counted. Based on these calculations, these 30 seconds period is considered as positive (apnea occurred) or negative (apnea not occurred).

**Results:** Experiments show that proposed method is promising.

**Conclusion:** The proposed hardware and software shows reasonable apnea detection capability. There is a tradeoff between detection accuracy and Portability and cost-effectiveness.

**Keywords:** mHealth, sleep, apnea

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## “Requirements of a telemedicine system for treating breast cancer patients”

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**Background:** Software requirements are features that a software system must have in order to meet the needs and solve a specific problem for which the software was developed.

**Objectives:** The purpose of this study is to identify the requirements and capabilities of a telemedicine system that is used to provide treatment plans for breast cancer patients.

**Materials and Methods:** This qualitative study was conducted with the participation of oncology specialists active in breast cancer treatment (n=12) and faculty members of health information management (n=5) and medical informatics (n=5). Data were collected through face-to-face interviews and analyzed using content analysis.

**Results:** Functional requirements were one of the main themes, which were grouped into six main categories, including basic requirements for all users, requirements specific for system administrator, requirements specific for physicians involved in providing a treatment plan to patients, requirements specific for residents, requirements specific for patients, and communication with other information systems. Also, non-functional requirements were grouped into five main categories, including security and privacy, usability, reliability and supportability, integrity, and efficiency.

**Conclusion:** Software requirements are a complex combination of the needs of different people at different levels of an organization and the environment in which the system must be implemented. During the requirements engineering process, the development team must interact with the stakeholders of the system in order to identify the exact and complete requirements of the software system. Therefore, stakeholders and end users of the system play an important role in identifying system requirements.

**Keywords:** Requirements, Functional, telemedicine, Oncology, Breast cancer



## “Digital health-based interventions and their roles in diet and nutrition issues in children and adolescents”

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**Background:** Poor eating habits and unhealthy nutrition is a major risk factor for non-communicable diseases and a major threat to the current and future health of children and adolescents. Therefore, it seems necessary to use new and technology-based solutions in order to improve people's diet.

**Objectives:** Today, the use of digital technologies by nutritionists and their clients is increasing. In this regard, the purpose of this study is to investigate the roles and

effectiveness of digital health-based interventions in diet and nutrition issues in children and adolescents.

**Materials and Methods:** In this narrative review study, the keywords "e-health", "digital health", "mobile health", "Telemedicine", "Telehealth", "nutrition", "diet", "children" and "adolescent" in reputable databases including, PubMed, Web of Science, and Scopus to search and extract related literature with English language restrictions and no time limit.

**Results:** The findings of the current research showed that various digital tools and technologies, including the Internet, computers, mobile apps, games, videos, social media, telemedicine, websites, and SMS text messaging have been used to develop practical digital interventions in the nutrition and diet field. The use of these technologies has led to an increase in awareness and self-monitoring, improvement of nutritional literacy, and change of attitude towards eating habits in children and their parents.

**Conclusion:** Although there is considerable evidence on the effectiveness of using digital nutrition interventions, however, due to the heterogeneity in different studies, it is suggested that studies be conducted to investigate the effectiveness of using these interventions in the long term period.

**Keywords:** Nutrition, E-health, Digital, children, mobile

## “Investigating the effectiveness of using virtual reality in cardiopulmonary resuscitation: a systematic review”

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**Background:** The most important factor in the survival of people in sudden cardiac arrest is the presence of a person trained to perform cardiopulmonary resuscitation (CPR) immediately after the occurrence of it. Virtual reality (VR) is a new technology that has been used for education in many medical fields. This technology has been proposed as a powerful tool for improving CPR performance.

**Objectives:** This systematic review aimed to investigate the effectiveness of using VR in CPR training.

**Materials and Methods:** Four databases, including Medline, Scopus, Web of Science, and IEEE Xplore were searched to retrieve related articles published until

May 20, 2022. This systematic review was conducted based on Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guideline. All randomized trials that investigated the effects of VR on CPR education were included.

**Results:** After reviewing the titles and abstracts of 3,348 retrieved studies, 42 studies seemed to be relevant, and after reviewing the full text of the articles, finally 10 articles were included in this systematic review. The oldest study was conducted in 2013 and the most recent one was conducted in 2022. The results of this research showed that virtual reality was as useful as face-to-face training in 100% of studies. The most positive effects of VR included improving knowledge retention, people's performance in terms of chest compressions, participants' satisfaction, ease of use, usefulness, appropriateness, and learning outcome.

**Conclusion:** VR has great potential in increasing people's skills in CPR training and can be effective in this field.

**Keywords:** Cardiopulmonary resuscitation, Virtual reality, Effectiveness

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## “Investigating the results and methods used in the evaluation of speech therapy digital games in children: a systematic review”

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**Background:** Today, the use of digital games has increased in healthcare, and speech disorders are no exception. To ensure the effectiveness of these games in clinical settings, they must be evaluated and their results determined.

**Objectives:** This study aimed to investigate the methods and results of using these games in speech therapy.

**Materials and Methods:** Four databases, including Medline (through PubMed), Scopus, Web of Science, and IEEE Xplore were searched to retrieve related articles published until July ۱۴, ۲۰۲۱ by keywords and Mesh terms related to “Game” and “Speech”. Articles were included in this systematic review that developed and evaluated a speech therapy game for children.

**Results:** After examining the abstract and title of ۱۱۳۳ articles, finally, ۲۴ studies were included in this systematic review. This systematic review showed that the games designed in this field had been evaluated from the following three aspects: ۱) evaluating the performance of the speech recognition system used in these games, ۲) assessing the usability of designed games, ۳) evaluating the effectiveness of the designed game with end users. The results of these evaluations have shown that the games designed in this field can increase entertainment, desire to continue treatment, and motivation in children.

**Conclusion:** The use of digital games in speech therapy has great potential to make therapy sessions fun for children, thus increasing compliance with the treatments provided.

**Keywords:** Digital games, Children, Evaluation

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**“Improving the virtual education system and the role of mobile in students' learning: challenges and suggestions from the experts' viewpoints in the field of university education”**

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**Background:** Mobile education technology is one of the new technologies in new era that has gained its place in field of education.

**Objective:** This study investigate the impact of mobile education in improving the education system and students' learning and providing points of view and suggestions to implementation of this method in educational environments.

**Material and Methods:** This qualitative-descriptive study was conducted in two phases of group discussion and Delphi method. With using the Delphi technique, in two rounds, a semi-structured questionnaire regarding the points of view and implementation strategies for the development of mobile education was given to 8

professors. In second round, the items raised by them were given (score 7-10) and priority items were determined.

**Results:** 4 female and 4 male professors with an average age of 48.8 and more than 10 years of experience in education participated in this study. The main solutions in the development of virtual education were in 17 concepts and 3 components in order of priority: designing comprehensive mobile software in education, developing network infrastructures, producing books and electronic content in this area. Also, issues such as the lack of concentration of learners in educational classes, the time-consuming nature of teaching, and the resistance of professors in using new technologies were raised as the major challenges.

**Conclusion:** The development of mobile technology and the removal of obstacles can, in addition to improving the quality of education, increase justice and improve the education system of the country.

**Keywords:** Virtual, Education, Mobile, Suggestions, Limitations

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## “The role of M-health in the crisis management of the of the Covid-19 disease in the years 1399-1401”

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**Objectives:** This study has been conducted with the aim of investigating the role of companion health in the crisis management of the Covid-19 disease between 1399-1401.

**Materials and Methods:** This was a cross-sectional descriptive study conducted in two main steps. First, a systematic search was conducted via keywords related to Covid-19 and (m-Health). Then, the retrieved apps were analyzed according to their characteristics. Finally, the use-cases of the given apps were examined based on their application.

**Results:** Overall, the reviews confirmed the effectiveness of the m-Health program. In China, the results showed that people who use public health programs are more satisfied than people who do not use public health programs. The health care

assurance value of health programs and health care assurance have positively influenced the interaction between users and health program functions, information interaction, and interaction with physicians to improve users' satisfaction with public health governance. In Malaysia, respondents had a favorable attitude towards mHealth performance evaluation (82.7% for managing Covid-19). Studies have shown that although these programs are significant in terms of quantity, they are not widespread in terms of use cases.

**Conclusion:** It appears that m-health technologies played a positive role during the Covid-19 outbreak. Given the extensive capabilities of m-health solutions, investigation and use of all potential applications of m-health should be considered for combating the current Epidemics and mitigating its negative impacts. M-Health is an appropriate method for encountering epidemic/pandemic outbreaks due to its extensive applications.

**Keywords:** Covid-19, Coronavirus, Mobile application, Mobile health

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## “Mobile-Health Challenges in Management of Infectious Diseases Diagnosis”

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**Background:** Infectious diseases are disorders caused by microorganisms. Many of those microorganisms live on or inside our body, and many of them are naturally harmless or even helpful, causing disease under certain conditions. Since that many of the signs and symptoms of infectious diseases may be similar, it is necessary to perform laboratory tests or imaging to diagnose the cause of the symptoms. The use of mobile systems and related healthcare technologies has significantly accelerated the diagnosis of diseases.

**Objectives:** The aim of this study was to search Mobile-Health challenges in management of infectious diseases diagnosis.

**Materials and Methods:** To perform this review, we searched through Google Scholar, PubMed and Web of Science databases from 2012 to 2022.

**Results:** New possibilities have been presented to diagnose and control infectious diseases and generally improve the efficiency of the health system globally, but there are still challenges in realizing their potential to increase patients' access to testing and improve the overall health level with prognosis and timely diagnosis of diseases has put many difficulties in this path.

Imaging tests such as X-rays, CT scans and MRIs, which require advanced equipment for accurate diagnosis. Sampling of body fluids, blood tests, throat swabs, sampling of cerebrospinal fluid and other methods that require the physical presence of the patient in order to make an accurate and timely diagnosis and help the doctor to choose the right treatment is the difficulties of using M-Health technology in the diagnosis of infectious diseases.

**Conclusion:** The promise of automated self-examination or mobile-assisted with connected and efficient link to care is one of the goals in the field of medical-technological approaches.

**Keywords:** Mobile-Health, diagnosis, infectious diseases

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## “Mobile Health and Organ Transplantation”

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**Background:** Mobile Health is one of the best approaches for end-stage organ transplant patients. There are several mobile apps which can be used to improve a patient's health state after receiving an organ. Numerous research has been done and results show that the patients achieve a satisfying level of life by using mobile apps.

**Objectives:** To review the usefulness of Mobile Health in organ transplant patients

**Materials and Methods:** This study is a review, which resulted from search in Google Scholar, PubMed and Web of Science databases in 2022.

**Results:** Besides the problems which a patient may face during and after organ transplantation, non-adherence to the medication is one of the post-transplant problems. Mobile apps have a great effect on solving this major problem. These apps also help to monitor patients and how they use their medications.

Many of these patients should cope with chronic conditions such as hypertension; to handle this, m-health comes up with some useful applications. According to the studies' results, m-health improves blood pressures in a large number of patients who had kidney transplantation.

Medication's side effects are another problem which occurs in patients especially who receive organ transplantation. After transplantation you should use immunosuppressors and these drugs have a lot of adverse effects. By using mobile apps, these negative side effects may be controlled and reduced.

**Conclusion:** These modern technologies have achieved great success in decreasing problems and improving patients' health after transplantation. Although, more accurate apps and programs are needed to be designed.

**Keywords:** Mobile Health, patients, Organ Transplantation

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## “Role of Personality Character in Cyberchondria during the Coronavirus Disease 2019 Pandemic”

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**Background:** Cyberchondria is a form of anxiety characterized by excessive searching of online medical content about health, which in most cases results in increased psychological helplessness, worry, and unnecessary medical expenses.

**Objectives:** This research aims to determine the relationship and predictive contribution of personality traits to cyberchondria during the coronavirus disease 2019 (COVID-19) pandemic.

**Materials and Methods:** The research method is descriptive and of correlational designs. The statistical population includes all women and men of the city of Shiraz in 2021 who voluntarily responded online to the cyberchondria scale, and personality dimensions' inventory. Data analysis was performed with Pearson's correlation coefficient and stepwise multiple regression using SPSS software version 22.

**Results:** The research findings showed a significant correlation between personality dimensions and cyberchondria. Also, according to beta coefficients, neuroticism as personality traits predict cyberchondria.

**Conclusion:** Some personality traits, especially neuroticism, are among the facilitating factors that can contribute to the creation or continuation of mental and behavioral disorders.

**Keywords:** Personality character, Cyberchondria, COVID-19

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## “Mobile apps for neonatal jaundice diagnosing: A systematic review”

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**Background:** Neonatal jaundice or hyperbilirubinemia is a very common complication among premature and breast-fed infants. Late diagnosis of jaundice can lead to brain damage or death. Therefore, clinical decision support systems based on mhealth can help in the timely diagnosis of jaundice.

**Objectives:** This systematic review aimed to assess the effectiveness of mobile apps for diagnosing jaundice in neonates.

**Materials and Methods:** A comprehensive literature search (up to November 2022) in PubMed, Cochrane, IEEE, Web of Science, and Scindirect was conducted following the PRISMA guideline. The combination of the words jaundice, icterus, and hyperbilirubinemia along with the words mhealth, smart phone, apps and mobile health were searched. Initially, 98 articles were retrieved that 30 were duplicates. After reviewing the title and abstract of the articles, 41 articles were excluded (Full text unavailable, non-English language, non-diagnostic

app and adult jaundice). The articles were independently reviewed for eligibility by two authors. Endnote X<sup>9</sup> was used to organize articles.

**Results:** In 8 included articles, jaundice diagnosis were based on skin (n=7), eye(n=1) and blood serum images(n=1) using regression technique(n=0) and machine learning methods(n=1) including SVR, KNN, SVM, DT, RF, MLP and deep learning. The reported sample size varies from 10 to 230. Correlation between system diagnosis and TSB value has been reported from 0.59 to 0.99 (mean=0.77±0.18). The sensitivity and specificity of the systems were higher than 78% (mean=89.7±11.21) and 70% (mean=74.29±14.94), respectively.

**Conclusion:** The results showed that the mobile applications equipped with image processing can be a suitable tool for non-invasive screening of neonatal jaundice.

**Keywords:** mobile application, neonatal, jaundice, mhealth

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## “Investigating the effect of Telerehabilitation on self-care of patients with spinal cord injuries”

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**Background:** Spinal cord injury is an important treatment problem. Due to the nature, they need continuous training in order to gain individual independence and prevent the complications caused by the injury. Telerehabilitation includes support, information, and rehabilitation services provided through communications and information technology.

**Objectives:** The aims of this study is to investigate the effect of telerehabilitation on self-care of patients with spinal cord injuries through valid scientific databases.

**Materials and Methods:** This study is a systematic review in which relevant keywords were searched in PubMed, Scopus, Web of Science, Embase, SID, and Magiran databases in ۲۰۲۲. The inclusion criteria were studies and protocols of randomized controlled trials with a Telerehabilitation approach in spinal cord injury. In order to evaluate the quality of the studies, the JBI quality assessment checklist for randomized controlled trial studies was used.

**Results:** 13 related studies were selected from a total of 1102. The results showed that remote rehabilitation approaches included supportive applications (4 cases), supportive websites (9 cases) and video conferences (4 cases) and follow-up periods ranged from 6 weeks to 18 months. The use of rehabilitation was effective in reducing the incidence of complications of pressure ulcers and muscle atrophy and improving individual independence and communication and functional activities.

**Conclusion:** Based on the findings, telerehabilitation in patients with spinal cord lesions is accompanied by an increase in the interest and satisfaction of patients to receive treatment. Therefore, Telerehabilitation can be a safe, effective, and viable tool for providing rehabilitation services.

**Keywords:** telerehabilitation, telemedicine, spinal cord injuries, self-care

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## “Application of telehealth for self-care in gastrointestinal cancer patients”

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**Background:** self-care by patients along with improving the health of patients and patient satisfaction, reducing the financial burden of hospitals and health centers is one of the approaches of providing Telehealth self-care education, which is used for training and follow-up of self-care. Therefore, in this research, the use of remote health in self-care Gastrointestinal cancer patients have been investigated.

**Objectives** The aims of this study is to investigate the use of telehealth for self-care in patients with gastrointestinal cancer through the review of reliable scientific databases.

**Materials and Methods:** The study was conducted in the form of a review in ۲۰۲۲. Searching for articles in the period from ۲۰۱۲ to ۲۰۲۲ was done from databases and search engine PubMed, Scopus, Web of Science, Embase, SID, Magiran by

searching for the main keywords of this research. ۱۳۴ articles were reviewed and after reviewing the abstract and then the full text of the article ,۱۶ articles were selected for the final review.

**Results:** In most of the reviewed studies, remote monitoring technologies and creating strategies to improve equitable access were investigated. ۳۵% of these studies examined the impact of telehealth on self-care and other studies on the economic consequences of telehealth and its impact on self-care education and health literacy and the changes in a person's attitude about illness.

**Conclusion:** Telehealth is a suitable method for training and follow-up of self-care in gastrointestinal cancer patients and can improve adherence to self-care in patients, which is suggested to be included in their treatment plan.

**Keywords:** Telehealth, self-care, gastrointestinal cancer

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## “Application of Mhealth in emergency medical services”

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**Background:** Emergency medical services systems are responsible for providing urgent medical treatments for patients. Emergency medical technicians, who are being sent to the mission by ambulance, are facing many problems in carrying out their missions using outdated technologies such as wireless sets.

**Objectives:** The purpose of this article is to investigate how the usage of mobile health applications can help improve emergency medical services.

**Materials and Methods:** In this systematic review study, search engines such as Scopus, Google Scholar, Web of Science, and PubMed have been searched for keywords such as Emergency Medical Services, Prehospital Care, Mobile Health, Applications, and their combinations. The authors assessed the results based on PRISMA guidelines. The period time from ۲۰۰۰ to ۲۰۲۲ was considered for the

selection of articles. After removing duplicate and irrelevant items, eight articles were selected and analyzed using the content analysis method.

**Results:** The use of mobile health applications can help emergency medical technicians in cases such as recording patient information, and treatment measures, access to the location of patients, sending information to the dispatch unit for consultation with a doctor, and transferring information to the emergency department.

**Conclusion:** The results of this study showed that emergency medical services can take steps to improve the quality of treatment by using mobile health applications. But we should not ignore challenges such as the need to connect to the internet in sending and receiving data in the use of these technologies.

**Keywords:** Emergency Medical Services, Prehospital Care, Mobile Health



## “Digital art therapy as a means to improve the psychological health of older adults”

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**Background:** Digital art therapy (DAT) is an effective method to improve the psychological health of people. digital tools such as smartphones, computers, tablets, and virtual reality are used to hold online meetings, share audio and video and chat. Considering the doubling of the older adults with psychological disorders by 2030, they can benefit from digital technologies.

**Objectives:** This study was conducted to review the role of digital art therapy on the psychological health of older adults.

**Materials and Methods:** An electronic search was conducted with the keywords “Mental Health”, “Art Therapy”, “Technology” and “Aged” without time limitation in Web of Science, Google Scholar, PubMed, Scopus, ProQuest, Magiran and SID databases. The inclusion criteria were relevance, full text, quantitative and qualitative structure, and publication in Farsi and English. After review by two researchers, duplicate and unrelated articles were excluded. Data reliability and validity were confirmed through the Lincoln and Guba method.

**Results:** Finally, 12 studies were reviewed. The specific benefits of DAT on the mental health of the older adults can be divided into the following four categories: social health (improving social participation and social connection), emotional health (reducing loneliness, anger and anxiety), behavioral health (increasing the active role in the treatment process, improving independence and overcoming disability) and spiritual health (creative expression and feeling wholeness).

**Conclusion:** DAT improves the well-being and quality of life of the older adults. When using DAT, it is important to observe ethical principles and obtain informed consent, especially in disabled people with cognitive disorders.

**Keywords:** “Mental Health”, “Art Therapy”, “Technology”, “Telemedicine” and “Aged”

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## “The use of digital health technologies in providing primary health care in COVID-۱۹ pandemic”

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**Background:** Among the world's greatest health crises, COVID-۱۹ significantly affects the healthcare system. Digital health has the potential to transform the delivery of health services, including PHC to alleviate or even solve certain problems during a pandemic.

**Objectives:** The aim of this study is to describe digital solutions for providing primary care and mitigating the impact of COVID-۱۹ on healthcare systems and communities.

**Materials & Methods:** We systematically searched PubMed and the web of science databases addressing the use of digital health technology in PHC. We only discuss the papers published during ۲۰۲۰ and afterward because there were no data regarding covid-۱۹ before this year. An analysis of all articles was conducted, and relevant information was extracted.

**Results:** Among ۹۰ related published papers, more than half of the studies addressed telehealth (n=۵۰) as the most commonly used technology. This was followed by mobile apps (n=۲۶). Other technologies used as follow were respectively search engines, artificial intelligence, chatbots, electronic health records, sensors, and social media. Meanwhile, digital technology was most widely used in two elements of PHC services including preventing, controlling, and managing COVID-۱۹ and non-communicable diseases during the pandemic.

**Conclusion:** Digital health technologies provide an opportunity to provide PHC services to improve the prevention and control of the rapidly changing nature of epidemics. In order to fight infectious diseases effectively, we need to have these as well as increase the digital literacy of health care professionals and the community.

**Keywords:** Digital health, COVID-۱۹, Pandemics, Primary Health Care

## “A study to design minimum data set for mental health services in disasters”

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**Background:** Disasters adversely affect physical and mental health. A number of factors can lead to adverse mental and physical health outcomes during disasters, so understanding survivors' behavioral health conditions and needs are crucial for public health officials.

**Objectives:** The aim of this study was to develop a mental health minimum data set for an electronic disaster information system so that disaster response personnel and policymakers could develop an action plan quickly in response to a disaster.

**Materials & Methods:** The present study is a mixed-method (sequential exploratory) study. In the qualitative phase, a literature review and semi-structured interviews with experts were conducted to generate an item pool for the mental health response in disasters. In the quantitative phase the quantitative content validity, Content validity ratio (CVR) and content validity index (CVI) were used.

**Results:** proposed data elements, 10 data elements were confirmed according to the opinion of experts and categorized into two main parts, pre-disaster part with three sections; including region profile, mental health local background, regional mental health committee affairs, and post-disaster parts with five sections including

disaster information, information of mental health teams, mental health status, mental health interventions, and mental health need assessment.

**Conclusion:** For policymakers and healthcare providers, collecting this minimum data set is important for preventing, controlling, and managing the mental health impacts of disasters as well as facilitating and promoting disaster prevention and response programs.

**Keywords:** Mental health, Registry system, Minimum dataset, Disaster



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## “EMT location provider based on people's mobile location by Non-Euclidean (routed) weighted k-means”

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**Background:** The most important thing that can reduce casualties is arrival at the place in the shortest possible time in an emergency event occurrence. Therefore, Emergency Medical Teams (EMTs) should be settled such that they have the most geospatial accessibility.

**Objectives:** We aim to provide a dynamic optimal localization for the EMT deployment for rapid accessibility to an emergency event, based on the number of available EMTs, geospatial accessibility, and Population density.

**Materials and Methods:** In this study, the optimal location of EMTs can be obtained by applying the Modified K-Means' centroids. The distance k-means' parameter is the traveled distance/time to cover accessibility properties like traffic, and transportation mode (foot, motorcycle, and car). The number of active mobile phone devices can be computed for each Base transceiver station (BTS) and therefore it provides a good estimation of population density in local areas. Thus, we can apply the k-means algorithm by considering the BTS's population ratio as the clusters' weight to better settle EMTs in an area with higher population density.

**Results:** A web-based application that provides optimal locations for all types of EMTs deployment based on taking a census of BTS's users, is proposed which can be online and dynamic.

**Conclusion:** We propose a framework for localizing EMTs which is efficient due to real accessibility measurements, and cover miscellaneous parameters that affect transportation costs like distance and time for EMTs in the case of emergency events.

**Keywords:** Health Services Accessibility, Emergency Medical Teams (EMT), Ambulances, Mobile applications, Unsupervised Machine Learning



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## “mobile health apps for Irritable bowel syndrome (IBS) patients: A systematic review”

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**Background:** As Internet and mobile phone usage increases, as technology develops new ways to collect data, and as clinical guidelines change, all areas of medicine face new challenges and opportunities. Irritable bowel syndrome (IBS) is one of many chronic diseases that may benefit from these advances in digital health.

**Objectives:** This review intended to lay a foundation for clinicians and information technologists to understand future directions and opportunities together.

**Materials and Methods:** This review study was completed in 2022. In this systematic review, papers related to mobile health apps in the field of Irritable Bowel Syndrome (IBS) were retrieved by using keywords. The databases were Scopus, PubMed, Science Direct, Web of science and Google Scholar. The time frame was between January 2010 and September 2022. Initially, a total of 310 papers were retrieved. In order to determine the eligible articles, two reviewers

independently reviewed the identified sources and at last, ۲۳ related papers were selected.

**Results:** The results showed that mobile health applications have significant benefits in education, reducing IBS symptoms, quality of life, quality of care, treatment adherence, medication management and follow up in patients with IBS. These applications are used in five different parts: education, monitoring, treatment, Follow up and patient satisfactions.

**Conclusion:** While studies have shown that mobile health can fit into, complement, and improve the standard clinical care of patients with IBS, there is a need for further validation and improvement, from both a clinical and patient perspective.

**Keywords:** Irritable bowel syndrome, mobile Health, Mobile Applications

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## “mobile health apps for Follow-up management of Patients After Liver Transplantation: A systematic review”

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**Background:** although improvements in multiple dimensions including refinement of explanting and organ preservation techniques, surgical techniques, perioperative care and the development of potent immunosuppressive drugs have improved the outcomes of liver transplantation, timely follow up in patients after liver transplantation has a great impact on improving their physical and mental conditions.

**Objectives:** This review intended to investigate the efficacy of mobile health applications for follow-up management after liver transplantation.

**Materials and Methods:** This review study was completed in ۲۰۲۲. In this systematic review, papers related to mobile health apps in the field of liver transplantation were retrieved by using keywords. The databases were Scopus, PubMed, Science Direct and Web of science. The time frame was between January ۲۰۱۰ and September ۲۰۲۲. Initially, a total of ۲۸۴ papers were retrieved. In order to determine the eligible articles, two reviewers independently reviewed the identified sources and at last, ۲۶ related papers were selected.

**Results:** The results showed The applications were used for various purposes such as physical activity, immunosuppressant medication use, diet, sleep, gastrointestinal function, T-tube drainage and recommended rehabilitation exercises. although the majority of the participants were satisfied with the mobile health applications, in some cases the patients were unsatisfied due to the complexity of the applications.

**Conclusion:** Rapid recovery and lower readmission rates within 30 days after discharge were evident for liver transplantation patients. Moreover, the apps promote the self-management and medication adherence, which improves patients' health-related quality of life and facilitates achieving optimal clinical outcomes in post-liver transplantation.

**Keywords:** Liver Transplantation, Mobile Health, Mobile Applications, follow up studies

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## “Requirement-centered design of an electronic personal health record to promote health for patients with Alzheimer in post-Covid-19 era”

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**Background:** Alzheimer's disease is an important challenge in worldwide. Various technologies, such as electronic personal health records based on mobile phones (ePHR-app), involved patients in care at a low cost, and as a result, prevented the progression of the disease and managed their health during the Covid-19 pandemic.

**Objectives:** This study was conducted with the aim of designing and developing an ePHR-app for managing the health of Alzheimer's patients during the Covid-۱۹ era and post.

**Materials and Methods:** This developmental-applied study was conducted based on the Design Science Research Methodology. The needs of the patients were extracted by reviewing related articles and conducting semi-structured interviews with physicians (n=۷), caregivers (n=۱۳), and two focus group meetings (n=۸). The initial version of ePHR-app was designed and developed based on the findings of the previous two phases. The ePHR-app was implemented based on the Android platform.

**Results:** The content requirements (e.g. clinical and medication history), structural features (e.g. technical features and data display methods according to users' needs), and essential capabilities (e.g. reminders and periodic reports) extracted from the interviews and used for the system design.

**Conclusion:** In this study, an ePHR-app was designed and developed for Alzheimer's patients. Early involvement of end-users in all stages of design, development, and implementation improves the acceptance of the ePHR-app. Using the ePHR-app can be useful in improving the health of Alzheimer's patients and providing effective support to physicians and caregivers.

**Keywords:** Design Science Research Methodology, Alzheimer's disease, Electronic Personal Health Record, Design, Implementation

## “Objectives, outcomes, facilitators, and barriers of mHealth interventions during Covid-۱۹ pandemic: a systematic review”

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**Background:** The spread of Covid-۱۹ showed the real ability of current technologies in the world. Mobile health (mHealth) as one of these technologies in the control, prevention, diagnosis, and treatment of this disease was very much considered.

**Objectives:** This systematic review aimed to evaluate the objectives, outcomes, facilitators, and barriers influencing the use of mHealth interventions for patients during the Covid-۱۹ pandemic.

**Materials and Methods:** A systematic literature review was conducted following PRISMA guidelines. We searched for the original articles published in databases such as PubMed until August ۲۰۲۲ using relevant keywords. Studies to be included will have mHealth as the primary intervention during the Covid-۱۹

pandemic. A qualitative content analysis was performed based on the theory of planned behavior and the health belief model using the ATLAS.ti software.

**Results:** In total, 1098 articles were screened, and 20 articles were included in this study. The objectives were follow-up and self-monitoring in half of the articles. While having different objectives, 30% of the articles analyzed reported satisfaction. The overall outcomes of mHealth intervention were classified as social outcomes (e.g. facilitating social interaction), clinical outcomes (e.g. decreasing mental health problems), and cost-effectiveness (e.g., reducing commute, fuel, and time to access care). 10 facilitators and 10 barriers influencing the use of mHealth intervention for patients were identified.

**Conclusion:** Developing a clear framework of the facilitators and barriers before the implementation of these systems could improve decision-making prior to the design and implementation of mHealth intervention.

**Keywords:** Mobile health, COVID-19, Barriers, Facilitators, Systematic Review

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## “Conceptual model design of a smart and safe medicine box for visually and hearing-impaired elderly people”

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**Background:** Due to busy daily activities and aging, people easily forget when and how to take medicine. Failure to take the medicine on time may cause severe health problems for some patients.

**Objectives:** To avoid such bad effects, we designed a conceptual model of a smart medicine box (SMB) as a smart medical assistant for patients.

**Materials and Methods:** This developmental-applied study was conducted based on the Function Analysis System Technique (FAST) theory in 2022. Based on this theory, the needs of 20 elderly users were investigated in the form of semi-structured interviews to design a conceptual model of a SMB. SMB can be adjusted and controlled by a mobile application.

**Results:** Safety and intelligence were considered in the design of SMB. The safety feature of SMB addresses the wrong dose of medicine, not taking the medicine and keeping the medicine out of the reach of children. The intelligent feature can also be set as visual and audible alerts. These alerts mainly signal when the medicines are about to run out or the person forgets to take their medicines or does not take the correct dose. In addition, with the help of the mobile application can send SMS or email notifications to the patients or their caregivers.

**Conclusion:** This article created a product based on the combination of functions and human-machine relationship, and the best plan was selected for design. This conceptual model can be used as a prototype for the design of SMB in the future.

**Keywords:** Design, Mobile health, Smart medicine box



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## “Opportunities and Challenges of Using Blockchain Technology in Medical Information Management”

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**Background:** Security and privacy of electronic information systems are critical issues for consumers and service providers. Blockchain is considered as a security tool in today's technology. The current research focuses on the opportunities and challenges of using blockchain technology in medical information management.

**Objectives:** The aim of this study is to determine the opportunities and challenges of using blockchain technology in medical information management.

**Materials and Methods:** The current review study was conducted using a library method in the period between ۲۰۱۲ to ۲۰۲۲. The articles were reviewed by searching the keywords Blockchain Technology, Healthcare, and Electronic Medical Record in Pubmed, GoogleScholar, IEEE Xplore, Science Direct, and Researchgate databases.

**Results:** Blockchain Technology plays an important role in the management of information records (e-medicine through proposed platforms such as medrec (decentralized approach to manage permissions, share data between health stakeholders, and create knowledge from the level of information access) FHIRChain (fast health interoperability records + blockchain). Also, ongoing efforts have been made to overcome limitations in scalability, security, and privacy in order to improve stakeholder confidence in the use of this technology and increase its adoption in healthcare.

**Conclusion:** The effectiveness of this technology, focusing on the safe sharing of electronic file data and reducing the possibility of theft and manipulation, decentralized storage, recording and tracking data, and eliminating data transmission intermediaries, is one of the most important results obtained from this research.

**Keywords:** Blockchain Technology, Medical Information, Data Management.

## “The Effect of Using Mobile Health Technology on The Improvement of Diet Quality; A Systematic Review”

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**Background:** Using mobile technologies for dietary and nutritional purposes has been increased recently. Assessment of diet quality according to Healthy Eating Index (HEI) as an indicator can be used to identify nutrient intake.

**Objectives:** The aim of this systematic review study is to determine the use of mobile health technology for improving diet quality.

**Materials and Methods:** The current systematic review study was conducted through a systematic search in reputable scientific databases including PubMed, Scopus, Web of Science and GoogleScholar search engine from 2010 to 2022 using keywords “Mobile Health”, “Diet Quality”, “E-health” and “Nutrition”. After the initial search only the title and abstract of interventional studies were examined for relevance to the study objectives and the unrelated articles were excluded. The

articles related to study aim were also evaluated through the Mixed Method Appraisal Tool (MMAT). Finally ۶ studies were included in the research.

**Results:** Most of the M-health applications were used to promote dietary changes. Some studies mentioned the use of mobile health for reducing weight or blood sugar level. In each study diet quality was measured using a different metric. Studies were assessed by individual dietary assessment using diet quality scoring. The majority of studies showed that mobile applications related to dietary enhanced diet quality.

**Conclusion:** Diet-related mobile applications can be used to improve diet quality. However, more targeted and longer-term studies are required to confirm the effectiveness of mobile applications on diet quality in adults.

**Keywords:** Mobile Health Technology, Diet quality, M-health, Nutrition

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## Using Mobile Health Applications in Organ Transplant Cares; A Systematic Review

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**Background:** Mobile health (m-health) offers medical care a new dimension, increases efficiency, and reduces costs. It can help the patient undergone transplantation during different stages especially post-transplantation.

**Objectives:** The aim of this systematic review study is to explore the use of mobile health applications in organ transplantation.

**Materials and Methods:** This systematic review study was conducted through an advanced search in PubMed, Scopus, Web of Science and GoogleScholar search engine using a combination of keywords and MeSH terms “m-Health”, “Transplantation”, “Self-care”, and “Applications”. Reviewed articles were from 2010 to November 2022. After removing the duplicate titles using EndNote software and checking the titles and abstracts of original articles, the related articles were reviewed by the researchers using the JBI tool. After checking the quality of the articles, the findings were entered in the desired checklist. Also, letter to editors, review articles (any type) and thesis were excluded.

**Results:** Reviewed studies were on kidney, liver, bone-marrow, and lung transplantation. Prominent topics for apps were self-management, adherence,

symptom-reporting, remote monitoring of vital signs, educational, and drug reminder. Studies showed that patients may be empowered by m-health applications and may be more likely to adhere their treatment plan. Concerns mentioned in the studies are privacy, rigorous data protection, ethical considerations, and legal aspects.

**Conclusion:** The use of m-Health apps after transplantation for patient engagement, self-care and self-monitoring has shown promising feasibility and acceptability. However, current interventions are supported by modest evidence of efficacy and more clinical data is needed to demonstrate its effectiveness.

**Keywords:** m-Health, Transplantation, Application, Self-care

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## “Application of mobile health in improving the nutrition of diabetic Patients”

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**back ground :** The urgent need of diabetic patients for treatment and control of their nutrition online and available requires us to check applications.

**Objectives:** Investigating the effect of the application in the treatment process of diabetic patients

**.Method:** The current study was a review and systematic search. Databases including OVID, Science Direct, Scopus, WOS, and PullMed and the Google Scholar search engine, the entry and exit criteria were selected and checked, and

the data were placed in the researcher's data collection form and using content analysis were analyzed.

**Result:**The findings showed that in the application of companion health in improving the nutrition of diabetic patients, there are softwares (My Suger, One Touch Reveal, Diabetes M, Glucose Body, Glucose Tracker, etc.) that are available and help the patient to control their nutrition, physical health and the condition of their diabetic process and blood glucose level. The existence of programs helps the patient to visit the doctor less often to adjust the disease process and have a suitable and affordable solution.

**Conclusion:**Complications of diabetes lead to huge costs for patients, while we can prevent this complication and also deal with it by using the food plan that we provide to patients through companion health. So, considering the importance of the issue, the authorities should pay special attention to the use of companion health in improving the nutrition of diabetic patients

**Keyword:** Diabetes, mobile health, nutrition, applications

## “Virtual Reality for Supporting the Treatment and Improvement of Symptoms of Patient with Major Depressive Disorder: Systematic Review”

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**Background:** Major depressive disorder (MDD) is one of the most common mental illnesses. In recent years, Virtual reality (VR) interventions have appeared more extensively used as a therapeutic tool in psychology and psychiatry.

**Objectives:** The study aimed to determine the effects of VR in treating and improving the symptoms of patients with MDD.

**Materials and Methods:** This study was conducted on the potential of VR in MDD in 2014-2022. The present article systematically reviewed available literature in PubMed, Google Scholar, and Scopus databases using PRISMA guidelines.

**Results:** A total of 144 studies were examined, and 18 articles were selected for the eligibility phase. We analyzed the resulting set of 18 studies that met the inclusion criteria. Six of them reported the usability of VR in treating MDD, five said the uses of VR in improving symptoms, and three articles showed how cognitive behavioral therapy is included as a part of VR technologies in depression.

**Conclusion:** The capability of VR to simulate reality could significantly increase access to psychological therapies for people who live in remote areas and do not receive adequate mental health care. Virtual reality has been successfully used to support treatment and can add many advantages to the treatment of MDD. However, there is a critical need for more investigation in the area, and it is required to develop constant validations.

**Keywords:** virtual reality, haptic technology, major depression disorder, depression



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## “MyMed: An Innovative Medical Gadget for the Management of Surgeon's Hand Tremor”

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**Background:** Surgeon's hand tremor is considered as detrimental during surgery, which can potentially influence patient safety and the outcome of microsurgical operations. Various mutable factors have been shown to be associated with hand tremor of the surgeons including stress and anxiety, mental fatigue, inappropriate physical activity before the surgery, and unfavorable dietary intakes of caffeine, high sugar energy drinks, etc. Therefore, regarding the popularization of digital technologies, using gadgets as surgical instruments provide a suitable opportunity to overcome the operating room adverse issues.

**Objective:** The goal of the present study was to develop a Persian-language medical gadget (MyMed) for surgeons, to improve surgical tremor.

**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 medical gadgets. Furthermore, several surgeons were consulted to recognize their preferences, barriers, and facilitators in using a medical gadget. Then, the main features of MyMed were designed based on the collected information. Eventually, the final version of MyMed was developed under the supervision of the team consists of surgical technologists, psychologist, nutritionists, and expert hardware technology developers.

**Results:**

MyMed can accurately detect signals of the surgeon's hand tremor compared to normal level and alarmed the associated risk situation. It also provides quick practical psychological tips such as controlling stress and anxiety, improving mental abilities, and preoperative nutritional recommendations for surgeons.

**Conclusion:**

MyMed may be a helpful approach in empowering surgeons to acquire self-care abilities and ensure overall operation outcomes.

**Keywords:** Tremor, Surgery, Operating Room, Technology, Stress

## “Studies on smartphone applications for contact lens wearers: A systematic review”

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**Background:** Contact lens wearers need education and achieve information to use contact lenses. Available education methods cannot transfer information well and effectively. Nowadays, new methods mobile applications have been utilized to fill the gaps.

**Objectives:** The aim of this study was to investigate the existing studies describing the design, development and use of mobile applications for contact lens wearers.

**Materials and Methods:** In this systematic review study, we searched data bases including Google Scholar, PubMed, and Scopus to find relevant studies. The studies published between 2000 to 2022 were included. Terms related to contact lens, mobile application, smartphone application, contact lens wearer, and eye lens were used in search strategies. Inclusion and exclusion criteria were applied to select articles.

**Results:** A total of 201 studies were retrieved and after reading of studies, 9 studies were selected for full-text reading. After investigations of studies, we found that no

studies were fulfilled for designing or implementing a mobile application for contact lens wearers. Two studies investigated the needs of contact lens wearers and suggested the development of plans in the future.

**Conclusion:** Although the use of mobile applications in various fields of health and medicine has become popular in recent years, scientific efforts have not been made in the field of contact lenses. Considering the role of mobile health in improving the health of people and helping to improve the practice of contact lens wearers, designers and policymakers should be having appropriate planning to apply it.

**Keywords:** Contact Lenses, Mobile Applications, Systematic Review

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## “The effect of online spiritual care training program on psychiatric nurses’ competencies in spiritual care and integration of clients’ religion/spirituality into mental healthcare”

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**Background:** Religion/spirituality (R/S) plays a significant role in most clients’ lives in healthcare systems. Evidence shows that most psychiatric nurses receive little or no training in spiritual care (SC) and are unable to integrate clients’ R/S into mental healthcare.

**Objectives:** To address this gap, the present study aimed to investigate the effects of an online SC training program on psychiatric nurses’ competencies in SC and the integration of clients’ R/S into mental healthcare.

**Materials and Methods:** This experimental study was conducted with nurses working in a psychiatric hospital in Iran. Random sampling was performed and 90 nurses were assigned to the intervention (n = 50) and control (n = 40) groups. Online SC training was conducted for the intervention group in four sessions over four weeks. Data were collected using the Self-Assessment of Spiritual Care

Competency and R/S Integrated Practice Assessment Scale before and one month after the training program.

**Results:** There were no significant differences between the two groups before training ( $p > ۰,۰۵$ ). After the training, nurses in the intervention group obtained significantly higher scores in competencies in SC and integration of clients' R/S into mental healthcare compared to the control group, with a considerable effect size ( $P < ۰,۰۵$ ).

**Conclusion:** The online training program positively affected psychiatric nurses' competencies in SC and the integration of clients' R/S into mental healthcare. Since SC is a critical need for clients, specifically in mental healthcare settings, nurses must receive continuous education to provide SC to various clients.

**Keywords:** Education, Religion, Spirituality, Mental Health Nursing, Spiritual Care Competency

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## “Maturity level Assessment of Health Institutions to Implement Telemedicine Services: A Cross-sectional in Kashan University of Medical Sciences”

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**Background:** Telemedicine is the use of electronic information and communication technologies to provide health care at a distance. Success rate in telemedicine implementation is related to readiness of organizations and it could be assessed by a maturity model.

**Objectives:** The study aimed to determine the level of maturity for the implementation of telemedicine in Kashan University of Medical Sciences.

**Materials and Methods:** A descriptive cross-sectional study was conducted on 21 persons in six hospitals during 2021-2022. Data were collected using a standard tool developed by Pan American Health Organization (PAHO) in 2020. This tool has 99 questions in 6 sections, four scales which were determined according to the status quo in each institution: none (1 Point), beginner (2 Point), advancing (3 Point) and ready (4 Point). Data analysis was done by SPSS.

**Results:** Based on finding, the average score of Digital Processes and Expertise domain were 1.94 and 1, which indicated none maturity levels so that no initiative was in place. Average score of Organizational readiness, Digital environment, Human resources and Regulatory issues were 2.1, 2.1, 2.04 and 2.31 which represented the Beginner maturity levels so that means some steps have been taken, but the institutions still far from being able to implement services.

**Conclusion:** Based on results, Kashan University of Medical Sciences is still in the early levels of maturity and it still not able to implement telemedicine services so that provide a robust infrastructure is necessary.

**Keywords:** Telemedicine, Mobile health, Maturity, Readiness, Models.

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## “Mobile Health Apps for Patients with Alzheimer’s and Dementia”

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**Background:** As the world's population ages, the prevalence of Dementia and Alzheimer's disease is also increasing. Due to the lack of curative treatment for these patients, prevention and postponing symptoms of these diseases is very important. The use of mobile health apps can improve patients' social status, independence in their everyday activities, health status, living standard, or leisure activities.

**Objectives:** The aim of this study is to survey mobile health apps for patients with Alzheimer's and Dementia.

**Materials and Methods:** This narrative review article was conducted in 2022 using PubMed, Web of Sciences, and Google Scholar. After the final survey, 18 resources obtained the required validity based on the study's aim.

**Results:** The findings of the present study showed that four apps were used by caregivers to facilitate the support, education, and care of people with dementia and Alzheimer's. Two apps were designed for healthcare providers to continuous monitoring and screening of these patients. 12 apps were used by dementia and

Alzheimer's patients to increase independence, life quality, learning, and safety; so also to reduce symptoms and confusion.

**Conclusion:** Designed apps can improve the quality of life of people with Alzheimer's and dementia with early detection and prevention and onsets of symptoms of these diseases. As a result, the heavy economic, social, and medical burdens of these diseases will be reduced.

**Keywords:** Mobile Health(mHealth), Dementia, Alzheimer Disease



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**“Evaluating the advantages and disadvantages of electronic prescribing system, from the point of view of general practitioners; A global systematic review study”**

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**Background:** Since the implementation of electronic-prescription, physicians have confronted with its advantages and disadvantages.

**Objectives:** this study aimed to evaluate advantages and disadvantages of electronic prescribing system, from the point of view of general practitioners globally.

**Materials and Methods:** Current study is a quantitative systematic review. A systematic literature search was carried out in PubMed, Google Scholar, Scopus; using different search-terms such as ["gain\*" OR "strength\*" [MeSH Terms] OR "weak\*" OR "negative\*" OR "cost-benefit analysis"[MeSH Terms] OR ("benefits" AND "costs") OR "benefit\*" "disadvantage" OR "vulnerable populations"[MeSH Terms] AND ("electronic prescribing"[MeSH Terms] OR "electronic prescribing" OR "prescription")] . The searching was limited to the English language and only systematic reviews.

**Results:** Overall, ۲۰ systematic reviews and meta-analysis were assessed in ۹ countries. All were published between ۲۰۱۸-۲۰۲۲. One article was reported from Iran. ۱۷ of ۲۰ systematic reviews addressed the advantages and the other three addressed the disadvantages of this system.

Some results are as follows:

- In ۲۰۱۰, the e-prescribing system confronted with resistance in Brazil due to lack of physicians training and age, system safety, and infrastructural technologies.
- A study in the USA has highlighted the following problems with e-prescribing: failure of therapy alteration and important information transportation, and miss prescribing the drug name, dosage or abbreviation.
- In covid-۱۹ pandemic electronic-prescribing helps with reducing physical contact and exposure to the virus risk.

**Conclusion:** The review shows us the wide variety of advantages of this system and its few disadvantages at the global level.

**Keywords:** Strengths, weaknesses, electronic-prescribing, general-practitioner



## “Review of Liver Transplant Mobile Applications: Analysis Using the Mobile Application Rating Scale (MARS)”

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**Background:** The field of transplantation has seen many changes; certainly, the biggest advances have been in liver transplantation. The importance of mhealth solutions is well established. There are different ways to evaluate the quality of health apps. One of the methods for evaluating the quality of online store applications is the MARS.

**Objectives:** Our study aimed to evaluate the quality of liver transplant applications using the MARS scale.

**Materials and Methods:** This study was conducted to investigate applications related to liver transplantation in the Google mobile application store and analyze them using the MARS tool. The search for applications related to liver transplantation in the Android operating system (Play Store) was conducted using two reviewers in November 2022. In this study, we used keywords related to “liver transplant” to search Google Play.

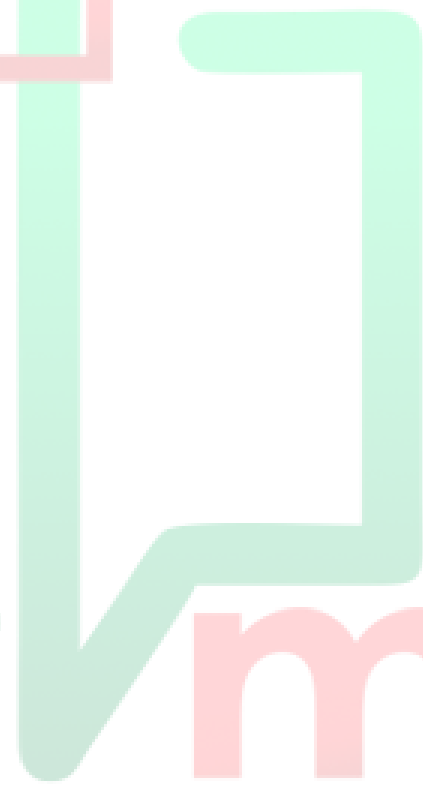
**Results:** In this study, 20 apps from Android Play Store were entered for review. All apps had an acceptable MARS score (< 3, 0). In addition, overall, the highest

average app quality score was the “transplant care doctor” app (4.47/5). Apps scored highest in performance and lowest in entertainment.

**Conclusion:** Most applications focused on providing factual and visual information, tools to monitor symptoms, and resources to help patients and physicians. MARS can be considered a valid tool to check the quality of mobile-based applications. MARS-rated programs can be used as recognized and trusted resources for patients, physicians, and health care professionals.

**Keywords:** Mobile Application Rating Scale, mobile applications, liver transplant, mHealth

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## “The Effects of Virtual Reality (VR) and Augmented Reality (AR) in Obstetrical and Gynecological care management: Systematic Review”

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**Background:** Labor pain, pregnant problems and special examination in women have negative effects; Pharmacologic analgesic modalities are effective but have side effects. VR (Virtual Reality) and AR (Augmented Reality) are creative alternatives for pain and anxiety management in obstetrical and gynecological field.

**Objectives:** Our study aimed to determine the effects of VR and AR during obstetrical and gynecological care management and investigate whether it affects patient satisfaction and reducing anxiety and pain.

**Materials and Methods:** A Systematic review based on PRISMA's statement was done. PubMed, Google scholar and Scopus databases were searched on December, ۲۰۲۲. Randomized clinical trials (RCT) with VR and AR intervention in obstetrical and gynecological treatment were selected. Two researchers extracted objectives, outcome, participant age, VR types and components from collected studies. Effective Public Health Practice Project (EPHPP) tool used for study evaluation.

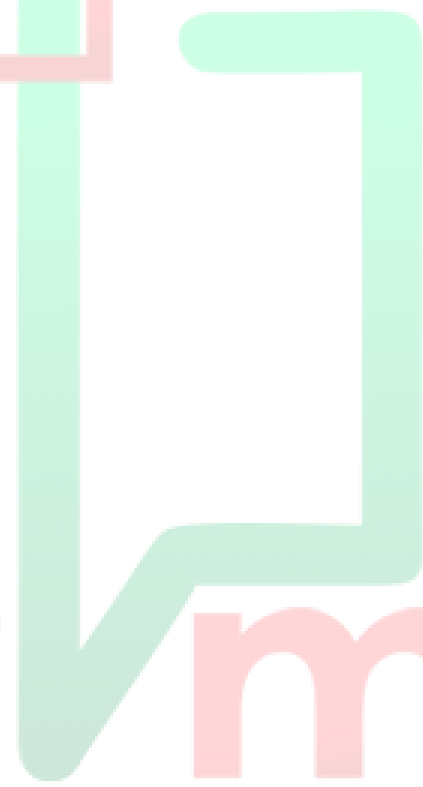
**Results:** Totally ۹۹ studies were identified, ۱۴ of them were RCTs and fulfilled the inclusion criteria of this study. Mostly care domain was for delivery both cesarean

section and normal vaginal delivery (n=۹). The most common type of VR and AR was immersive VR (n=۷) with glasses technology (n=۳). Most of the reports referred to outpatient (n=۱۲), reduce pain and anxiety (n=۱۰) and improve satisfaction (n=۳). Global rating was strong.

**Conclusion:** VR and AR will be an excellent tool for reduce obstetrical gynecology pain, eliminates anxiety, so suggested that RCT studies be conducted using virtual reality intervention in obstetrics and gynecology cases in Iran.

**Keywords:** Virtual reality, Augmented reality, Pregnancy, Delivery, Labor, gynecology, obstetrics

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## “Application of blockchain technology in the prevention of counterfeit drugs in the Drug Supply Chain”

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**Background:** Blockchain is a consensus based system that is useful for providing innovative solutions and increases transparency, eliminates counterfeit products..

**Objectives:** we present a systematic literature review focusing on the adoption of blockchain technology in the prevention of counterfeit drugs.

**Materials and Methods:** A sequential systematic literature search based on PRISMA's statement completed by until December 2022. The electronic databases searched were Medline (via PubMed), Science Direct and Google Scholar. A comprehensive search strategy was developed using MeSH terms related to blockchain and counterfeit drug. Review articles and letters to the editor were excluded from the study. We included English-language and original studies related to the application of blockchain in prevention of counterfeit drug. Studies were included after assessing the eligibility and a narrative combination was performed

by three reviewers independently. Full-text review and analysis were done on status, application, key feature, platform and type of blockchain. EPHPP tool used for study evaluation.

**Results:** Totally 93 studies were identified, of which six fulfilled the inclusion criteria of the review. The articles covered several application of blockchain. The most common topic in the status feature was system develop (n=2). Also, the most common area of application of blockchain in the pharmaceutical supply chain industry (specialty counterfeit drug) (n=2), the most common platform was Ethereum (n=2), the most common type of The blockchain used was hybrid (n=2) and the mostly key feature of the blockchain used was traceability (n=9). Global rating was strong.

**Keywords:** Blockchain, distributed ledger, Counterfeit drugs, Drug supply chain, Medledger, Drug traceability, Hyperledger fabric, Pharmaceutical industry, Ethereum.

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**“Prediction of neo personality dimensions in a dynamic collaborative learning environment using the Support vector machine algorithm with the aim of improve the individual and social health of society”**

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**Background:** Adaptation in educational systems allows the learner to benefit from learning content and other services of the system according to individual characteristics, and instead of treating everyone the same, the system treats everyone according to their characteristics. The personalization of the educational environment has an inevitable effect on academic progress and reduces stress, increases the student's relaxation, as well as the educational and psychological health of the society.

**Objectives:** identify the personality characteristics of students using artificial intelligence with the aim of personalizing education to improve the educational and personality health of society.

**Materials and Methods:** the information related to the change/non-change of the cohort of ۱۱۹ students who were randomly selected in a dynamic cooperative

learning environment in  $\forall$  training sessions was used to predict the personality characteristics of people. This article is implemented with SVM algorithm and Python language.

**Results:** Based on the available information, the machine was trained, and as a result, the machine was able to predict the dimensions of the learner's personality and used the information obtained from the individual characteristics of the learners to adapt the educational systems, with the aim of improving comprehensive educational and personal health.

**Conclusion:** Using the SVM algorithm, we checked Accuracy, Precision, Recall and  $F_1$  for each of Neo's personality dimensions, and we reached positive results for predicting the learner's personality dimensions based on the available information.

**Keywords:** SVM algorithm, Collaborative learning, Big Five Neo, educational and personality health

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## “The Effectiveness of Mobile Health in the Management of Preeclampsia: A Systematic Review”

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**Background:** Pre-eclampsia is a major cause of maternal and perinatal mortality and morbidity, especially in low-income and middle-income countries. One way to manage this disease is to use Mobile Health.

**Objectives:** The purpose of this study is to systematically investigate the effectiveness of mHealth in the management of Preeclampsia.

**Materials and Methods:** A search was performed using the main keywords " Mobile Health ", and " Preeclampsia " and their synonyms in Web of Science, PubMed, and Scopus databases until September 9, 2022. The original articles published in English that dealt with the " effect of using mHealth on the Management of patients with Preeclampsia " were included in the study and their characteristics were examined.

**Results:** Finally, 9 articles were included from the 308 articles found in the initial search stage, which examined patients' management using mobile health. Five studies (55.5%) considered mobile health to be effective in increasing blood pressure control. Other studies also found the use of mobile health in Diagnosis and prognosis (n = 1) and Reduction of preeclampsia (n = 1) were considered effective. Also, some studies showed that the use of mobile health for blood pressure and symptom monitoring in antenatal care for high-risk women is associated with lower costs compared to conventional care

**Conclusion** The use of mobile health effectively controls the disease and promotes management in Preeclampsia patients. It is suggested that mobile health tools and capabilities be used more widely in providing services to the community with Preeclampsia.

**Keywords:** Preeclampsia, M-health, Mobile health

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## “The effects of mobile health on health insurance organizations: A systematic review”

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**Background:** Day by day, over time, human science has increased and they can use them to solve problems and make life easier by creating new technologies. One type of technology is mobile health. In today's information age, this technology plays an important role. This technology can be valuable in health insurance organizations.

**Objectives:** The purpose of this article is to introduce the problems of the health insurance organization and examine the role of mobile health in solving problems and improving the current situation.

**Materials and Methods:** Systematic literature searches were conducted between September 23, 2021, and October 30, 2022, through PubMed, Embase, Research Gate databases, and Google Scholar search engine. The keywords were m-Health, mobile health, and health insurance. From the 1,831 abstracts retrieved, 102 articles were selected for full-text review, and 13 papers were related to the subject.

**Results:** According to the reviewed articles, the health insurance organization's problems include non-integrated insurance coverage, fraud, ethical risks, not paying attention to the insurance premium payment time, and the organization's relationship with customers. By using mobile health, these problems can be solved and the existing situation can be improved.

**Conclusion:** Mobile health insurance systems are remote communication tools that can manage people's health insurance coverage and people can register, pay or receive fees through them. Also, these systems increase audience attraction. These systems can notify people via SMS about everything from insurance coverage. This technology can manage insurance payments reliably and transparently, which helps to reduce moral hazards for hospitals and pharmacies.

**Keywords:** m-Health, mobile health, health insurance

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## “Digital Health in IBS Patients”

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**Background:** Irritable bowel syndrome (IBS) is a functional gastrointestinal disorder with high prevalence in population which negatively effects the quality of life and poses important problems for both patient and society. Digital health including telehealth, M-health or artificial intelligence, can be useful in different aspects for IBS patients like self-monitoring, educating, provide them a personalized diet by AI and etc.

**Objectives:** The purpose of this paper is to demonstrate D-Health impact in IBS patient's life.

**Materials and Methods:** this paper was based on research in two valid database (PubMed, google scholar) by using the relative keywords such as “Digital health”, “M- health”, “Artificial Intelligence”, “irritable bowel syndrome” and related concepts without time limitation. Among all the articles we found, highly and medium articles were selected and information was extracted.

**Results:** Since IBS is one of the most common functional bowel disorders, which negatively effects on quality of life, using D-health would make lots of changes in IBS patients. D-Health, according to reviewed articles by providing mobile applications, web-based apps, AI-based diets which are personalized and other

methods would improve self-management, educational support and increases adherence to diets and treatments and eventually leads to improving quality of life and the severity of symptoms.

**Conclusion:** Findings demonstrated that D-Health for IBS patients, made significant improves in their knowledge and symptoms severity which leads to better quality of life and less expenses, therefore it makes a great positive change in both patients and society.

**Keywords:** Digital Health, Mobile Health, Artificial Intelligence, Irritable Bowel Syndrome, IBS

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## “mHealth as Surveillance Tools in Rabies control and prevention”

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**Background:** Rabies is one of the most important zoonotic disease and health problems around the world. Over ٥٥٠٠٠ people die from rabies each year around the world particularly in Asia and Africa. Successful surveillance mostly depends on the timely gathering of information to assess disease status and determine appropriate control strategies. It is estimated that lack of a suitable and precise surveillance system, can lead to human death toll rise.

**Objectives:** There are few reports about the advantages of wireless technology and mobile phones for improving surveillance systems of rabies disease.

**Materials and Methods:** To address the aforementioned importance, we conducted a literature review about the application of mHealth in the surveillance and prevention of rabies around the world in recent years.

**Results:** The use of mobile phones, web applications, and wireless technologies in providing health services around the world has grown increasingly in recent years. mHealth can be utilized in different sectors of rabies surveillance like vaccination schedule alerts, data collection, team management, canine rabies vaccination programs, improving community awareness, and training health workers.

**Conclusion:** Wireless technology and mobile phones (mHealth) can facilitate rabies surveillance programs and lead to improved control and management of the disease.

**Keywords:** Humans, Rabies, Vaccination, Zoonoses, Wireless Technology.



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## “Investigating the relationship between the duration of hands-free use and head and neck disorders in university professors”

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**Background:** Hands free is a means of communicating through mobile phones, which has been developed in recent years.

This study was conducted with the aim of investigating the relationship between the duration of hands-free use and head and neck disorders in the professors of the University of Medical Sciences.

**Objectives:** This study was conducted with the aim of determining the Investigating the relationship between the duration of hands-free use and head and neck disorders in university professors

**Materials and Methods:** The present study was conducted on 300 professors of Shiraz University of Medical Sciences. Numerical pain scale and checklist of pain

and head and neck disorders were used to collect data. Pearson and Spearman statistical tests were used to check the relationship between variables..

**Results:** The findings of this study showed that there was a relationship between the use of hands free and headache, neck, shoulder, and shoulder pain. Also, the duration of using hands free was related to throat, jaw, ear, tooth, sinus, and nasal septum pain. There was a relationship between the duration of hands-free use and the feeling of sound in the ear, ear fullness and heaviness in the head

**Conclusion:** The findings of this study showed that the increase in the duration of hands-free use is related to ear, nose and throat symptoms and problems, as well as head and neck pain. Therefore, it is suggested to reduce the duration of using hands-free to reduce head and neck disorders in professors of medical sciences universities

**Keywords:** hands free, head and neck, pain, professors

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## “Metaverse and its applications in medical education area, a Systematic Review”

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**Background:** Today we see the usage trends of the term “metaverse”. The metaverse is a virtual sphere where users can create their own avatars, and perform activities that they do in real life. Although the term “metaverse” was known beforehand, its use extended during the COVID-19 pandemic era.

**Objectives:** The purpose of this study was to identify applications of metaverse in medical Educational.

**Materials and Methods:** We conduct a systematic search with the keywords “metaverse”, “education,” “medical education”, “metaverse technology”, in

PubMed, IEEE Explore, Sciencedirect and Scopus. Search was conducted on November 15, 2022 and was limited to English-written articles. The screening process of articles was conducted by two-reviewer respectively. The PRISMA protocol was used to select articles.

**Results:** In total 13 articles were found our criteria. Findings show although the term “metaverse” began to appear in medical articles in 2021 and 2022, types of the metaverse including augmented reality (AR), mirror world, lifelogging, extended reality (XR) and virtual reality (VR) have been published before that. Its uses and applications of metaverse include simulation-based blended training models, dental education, endotracheal intubation training, simulating surgical rooms, and training surgeons. Also, Collaboration and Peer Interaction by avatars of participants in the virtual class, smart operating room are Significance.

**Conclusion:** In the future metaverse can become a new educational environment that allows for interactive communication. Metaverse can be helpful for medical education policymakers and health educators to find the concepts of the metaverse and virtual education spaces and the strengths of their application.

**Keywords:** Metaverse, Education, Medical Education, Metaverse technology, Mobile Learning

## “Design, Implementation and evaluation of web-based e-learning app for PharmD students’ internship”

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**Background:** Increasing the knowledge of PharmD students in the skills of reading prescriptions, getting familiar with drug names, scientific evaluation of prescriptions, and providing drug recommendations are the goals of the pharmacy internship. The use of E-learning can be effective in increasing the skills of PharmD during the internship period.

**Objectives:** Development of a web-based e-learning app for PharmD students’ internship course.

**Materials and Methods:** The study was conducted in three stages. First, the system was designed based on the pharmacy faculty members and medical informatics perspectives. Second, a drug database was formed and the information on 2000 prescriptions was entered into the system. Third, the user management dashboard was implemented. Finally, the effectiveness of the application was evaluated using

the final exam. The programming language of c#, JQuery, and HTML<sup>5</sup> was used to develop this app. Programming was done in Visual Studio ۲۰۲۲ environment. The database was managed by Microsoft SQL Server ۲۰۱۸ software.

**Results:** The outcome of this study is an E-learning app for PharmD students. The usability features such as the interactive user interface and informative feedback to the student were kept into account. Students' activities are recorded for learning analytics purposes. Using the Bootstrap framework made it possible to have a responsive and mobile-first app. This app is web-based, so users with different operating systems (Windows, Android, and Mac) can use it. The evaluation resulted that academic performance was significantly improved.

**Conclusion:** Using this app can be effective as a blended learning tool in enhancing PharmD skills.

**Keywords:** E-learning, pharmaceutical education, Web-based application.

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## “Investigating the relationship between demographic and occupational characteristics on the use of educational technologies among the professors of the University of Medical Sciences”

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**Background:** In recent years, virtual education technologies play a very vital and valuable role in university education. This study was conducted with the aim of investigating the relationship between demographic and occupational characteristics on the use of educational technologies among professors of the University of Medical Sciences

**Objectives:** This study was conducted with the aim of determining the Investigating the relationship between demographic and occupational characteristics on the use of educational technologies among the professors of the University of Medical Sciences

**Materials and Methods:** The present study was conducted cross-section ally on 300 professors of Shiraz University of Medical Sciences in 2021. Sampling was

done according to the study entry and exit criteria. Data were analyzed using spss software and multiple regression tests.

**Results:** The results of this study showed that among the demographic and social factors, there are factors such as age ( $t=2.03$  and  $p=.04$ ), marital status ( $t=0.83$  and  $B=.2$  and  $p<.01$ ) and length of work  $t=2.93$ ,  $B=.37$  and  $P=.004$ ) was related to the duration of using virtual education technologies. The available variables explained 19 percent of the changes related to the duration of using electronic devices'  $r^2=.19$  and  $r^2=.19$

**Conclusion:** The results of this study showed that the duration of using educational electronic tools is related to some demographic characteristics and the duration of use. It is suggested to identify other factors related to the use of electronic educational devices in medical science professors.

**Keywords:** education, virtual education technologies, professors of medical sciences

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## “The effect of educational intervention Using Health Belief Model on the Preventive Behaviors of Pediculosis: A Mobile based Animation”

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**Background:** Pediculosis is one of the most important health problems in the world. The health education plays a major role in promoting health of the elementary students.

**Objective:** The aim of this study was Determining the effect of educational Mobile based Animation using the Health belief model on the Preventive Behaviors of Pediculosis in the Elementary Schools.

**Materials and Methods:** This quasi-experimental study was conducted on 100 first and second-grade students who were selected by using the cluster and randomized sampling method in two experimental and control groups. The data collection tool included a researcher-made questionnaire based on the health belief model and its validity and reliability were confirmed. The obtained data were analyzed using SPSS, version 23 and statistical tests.

**Results:** The results showed that the levels of the variables of knowledge, health belief model structures, and the behavior at before, immediately and two months after intervention were significantly different in the experimental and control groups ( $P < 0.001$ ). Additionally, there was a statistically significant relationship between the knowledge, perceived sensitivity, perceived barriers, and self-efficacy and the preventive behaviors in determining the relationship between the health model structures with preventive behaviors ( $P < 0.05$ ).

**Conclusion:** The results showed that the effectiveness of the Animation and its advantages such as "establishing an effective communication", "creating a learning motivation", and "adapting to multiple intelligences" resulted in a high level of enthusiasm in the students. Animation as an interactive multimedia approach creates a two-way training opportunity.

**Keywords:** Pediculosis, Health Belief Model, Preventive Behavior

## “Teaching Social skills to Preschool Children by “Sunflower” Application An Experience from Health care Providers of Gamified Learning”

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**Background:** Children need appropriate behavioral patterns to develop their talents and social skills. Health care providers, have an important role in this issue. This gamified software (Sunflower) has been designed with the aim of teaching how to create and develop social skills in preschool children.

**Materials and Methods:** Research method was DBR (Design Based Research). Software was design in Unity game engine and in C-sharp language. Designing was done based on OSCE examination approach with 40 questions in seven station stages to teach seven social skills: (verbal, non-verbal, playing, expression of emotion, courage, cooperation and group activity, and modeling). The effectiveness of the software was evaluated in a qualitative way by examining the experiences of health care workers from game-based training

**Results:** The participants found game-based education to be effective in increasing their knowledge, motivation, and interest in pursuing education. Also, the

possibility of practice and repetition and the impact of feedback on learning were the most important features of the expression game.

**Conclusion:** Electronic games can be a good way to update knowledge, and designing game-based courses is more suitable for motivating working people and matching their conditions.

**Keywords:** Gamified learning, Social skills, Preschool Children, Application



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## “Virtual Reality: An Analgesic Method in during Dressing Changes in Patients with Burn”

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**Background:** The procedures related to the care and treatment burn wound such as dressing changes and wound debridement are associated with pain and anxiety. Using distraction technique can be an effective method to reduce pain. Virtual reality as a clinical intervention can affect pain perception.

**Objectives:** This systematic review aimed to evaluate the effects of virtual reality on reduce pain and anxiety during burn dressing changes.

**Materials and Methods:** The study design is a systematic review. In October ۲۰۲۲, ProQuest, PubMed, web of science and Cochrane databases were searched to collect data. The search strategy based on the following key words: burns, virtual reality, pain, anxiety and pain relief. The primary research resulted in ۱۱۹ articles. After screening ۵۶ articles were selected for full text review, and finally ۱۹ articles were included in the systematic review. Using the PRISMA checklist, the data were extracted by the two authors independently and blinding was performed. Articles were analyzed according to the purpose of the research.

**Results:** Virtual reality can be effective in relieving pain, fear and anxiety. Virtual reality especially immersive VR, is an effective support method in post-burn procedure such as dressing changes, wound debridement and rehabilitation. The greater effects of immersive VR could have been caused by the immersion effect

when real stimuli were eliminated due to the perception of being in the non-physical world.

**Conclusion:**Virtual reality can be used as a supportive treatment in hospitalized patients of different ages and with different body burn areas to relieve pain. Furthermore, by conducting more research and studies on larger groups of patients, it can be used as a standard treatment during procedures for burn patients.

**Keywords:** burn, virtual reality, pain, dressing change



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## “Virtual reality: A new technology in the prevention alcohol and drugs abuse”

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**Background:** the craving for drugs and alcohol plays an important role in maintaining the pattern of drugs use and drinking. Many people experience relapses after treatment, which is one of the main reasons for the behavioral approach tendencies caused by the symptom towards the addictive factor. considering the increasing number of people suffering from alcohol and drug abuse, a new approach is needed. new technologies such as virtual reality can have the potential to prevent and control substance abuse and risky behaviors.

**Objectives:** This systematic review aimed to evaluate the effects of virtual reality on the prevention alcohol and drugs abuse.

**Materials and Methods:** We conducted an exhaustive literature search of the Web of Science, Scopus, Pub med and, using Google Scholar as search items terms such as alcohol, addictive, addiction, opioid, tobacco, nicotine, methamphetamine and virtual reality.

**Results:** virtual reality can play a pivotal role in addiction behavioral change. the results showed that virtual reality reduce craving across different substances. higher retention rate in the period of not using drugs, increasing self-confidence, improving coping skills and strengthening self-empowerment are other benefits of virtual reality.

**Conclusion:** Virtual reality establishes a controlled setting for patients with addictions. Through repeated yet controlled exposure to virtual cues, patients can develop and reinforce preventive coping skills or other behavioral measures.

**Keywords:** addiction, virtual reality, alcoholism

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## “Mobile health applications in clinical health services: opportunities and challenges”

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**Background:** Despite the great potential of mobile health technology applications, there are several challenges in front of the development and use of this technology.

**Objectives:** The aim of the present study is to provide an overview of the clinical health services and the challenges of developing and using this technology.

**Materials and Methods:** In the present review, the authors searched for eligible articles in SID, Google Scholar, and Web of Science databases. For this purpose, use the keywords "Mobile health", "health service application", "mobile technologies", "mobile health applications" to find related articles. After checking the quality of the articles with Prism guidelines and applying the inclusion and exclusion criteria, 12 articles were selected and the results were reviewed.

**Results:** The use of mobile health applications with an international structure and legal license reduces related costs, reduces medical errors, faster and better treatment process, easier access to medical care, providing health care for remote

areas, improving patient response. , the promotion of health care and telemedicine will be done.

**Conclusion:** There are many challenges and obstacles in the adoption and implementation of companion health programs. Lack of awareness and practical knowledge of healthcare workers, lack of necessary infrastructure and lack of support of senior managers for health programs are the most important obstacles in its realization.

**Keywords:** Mobile health application , Mobile technology , Mobile health, health service application , Clinical services

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## “The Use of Telemedicine in Covid-19 Crisis: A Review Study”

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**Background:** With the spread of the Covid-19 virus, the medical community considered it necessary to use telemedicine to the high volume of patients. Telemedicine platforms are one of the most efficient ways to overcome this disease by connecting the 3 elements of patient, therapist and facilities of the health system.

**Objectives:** The research was conducted with the aim of determining the use of telemedicine in the Covid-19 crisis by reviewing previous studies.

**Materials and Methods:** The present study is a review study using international and national databases including SID, Magiran, Google Scholar, PubMed, Web of Sciences, and Scopus during 2019-2022. Articles were searched using the keywords: Telemedicine, Health, Crisis and Covid-19. After searching, 20 articles were reviewed.

**Results:** During Covid-19, the therapists have provided the possibility of prevention, distance education, controlling on patient calls, daily visits and consultations, monitoring vital signs and clinical status, imaging and CT scan, pathology, laboratory treatment of chronic patients from long distance using the telemedicine system. This technology has led to an increase in improvement of

access especially in deprived and rural areas, reducing costs, sharing and transferring information, reducing mortality and increasing justice.

**Conclusion:** Due to the very contagion of the covid-19, the application of telemedicine has been more concrete to observe social distance; also, its use in the future, especially in infectious and chronic diseases, has been more accepted by the government. Identifying and solving the challenges of telemedicine in the Covid-19 era, would help to increase preparedness in future crises.

**Keywords:** Telemedicine, Health, Crisis, Covid-19.



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## “Challenges of Developing and Using Mobile Health; A Review Study”

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**Background:** Mobile health is a branch of e-health that provides health services and information through mobile technologies. With the expansion of mobile health, it is possible to prevent and manage diseases remotely.

**Objectives:** The current research was conducted with the aim of examining the challenges of health development and application along with a review of past studies.

**Materials and Methods:** The present study is a review study using international and national databases including IranMedex, SID, Magiran, Google Scholar, PubMed, Web of Sciences, and Scopus during ۲۰۱۹-۲۰۲۲. Articles were searched by using the keywords: Mobile health, Challenge, Problem, Health care, m-health, during ۲۰۱۵-۲۰۲۲. After the review, ۱۷ articles were evaluated considering the inclusion and exclusion criteria.

**Results:** The most important challenges identified for the use of mobile health include: organizational, technological, legal, ethical and administrative barriers, lack of acceptance and proper attitude of users, security and privacy problems, large costs of system implementation and maintenance.

**Conclusion:** It seems that there is no necessary match between the current interventions of companion health and the goals of its development and implementation, and it faces many challenges, and the solution of which requires the cooperation of managers, specialists and care workers, engineers and developers of companion health and health policy makers.

**Keywords:** Mobile health, Challenge, Health care



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## “Patient Engagement Mobile Health App Interventions in Health Area; A Systematic Literature Review”

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**Background:** Mobile health(mHealth) interventions refers to medical health practice supported by mobile devices. Patient Engagement and Involvement recognized as a key part of health care and a critical component that promote mutual accountability and understanding between the patients and health care providers. Patient engagement mobile apps (PEMA) are one of the newest ways that patient care is being delivered.

**Objectives:** The aim of this study was to examine assessment and reporting of PEMA in mHealth interventions for health care.

**Materials and Methods:** This was a Systematic Review. Four electronic databases; Web of Science, PubMed, Scindirect and Scopus, were searched in August ۲۰۲۲ using search terms for mHealth, Mobile Health, Patient Involvement, and Patient Engagement. Search was limited to English-written articles. The screening process of articles was conducted by two-reviewer respectively. The PRISMA protocol was used to select articles.

**Results:** In total ١١ articles were found our criteria. Findings show PEMA have benefits such as education patient, improving quality of health status and medication safety. Self-care and Self-monitoring, calorie tracking, fitness, and other exercise and education apps are major part of PEMA. Benefits of PEMA consist of Chronic disease management, Lifestyle management and Patient home exercise and self monitoring.

**Conclusion:** The results showed that this mobile apps being able to engage patients from a distance for any healthcare facility to keep their patients as engaged as possible. These medical apps can bridge between patient and healthcare organizations. Despite the many advantages of PEMA, there are still limitations in the development of these programs.

**Keywords:** Mobile health, Patient Engagement, Patient Involvement, mHealth

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## “Mobile health apps for nutrition and healthy diet; A systematic and practical review”

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**Background:** Mobile-based nutrition apps with capabilities such as checking the physical condition of each person, counting calories, controlling eating habits, providing tips on the nutritional value of foods, etc., help users to have proper nutrition and maintain an ideal weight.

**Objectives:** The aim of this initial evaluation study was on all Iranian mobile applications related to nutrition and diet therapy in 2022.

**Materials and Methods:** This cross-sectional descriptive study conducted based on the search of the keywords, weight loss, diet, calorie counter, diet therapy, along

with their English equivalents in databases and mobile app stores. The tool for reviewing the applications included in the study was the Mobile Application Rating Scale (MARS). A standard and well-known tool for comparing health-related applications

**Results:** Based on the division of the total of ۲۴۲ extracted apps, ۲۰۷ apps were active in the field of fitness and nutrition, ۱۴ apps were in the field of education, and ۲ apps were in the medical subgroup with a medical approach. The most developers were personal developers with ۱۲۲ cases, commercial and business development with ۱۱۴ cases and only one app developed by an academic center. In terms of the number of installations, only ۲ apps had more than ۱۰۰,۰۰۰ users, which belonged to the group of tools that were desired by users for managing calorie consumption and diet.

**Conclusion:** The results indicate that nutrition and diet mobile applications are useful tools to meet the educational needs of users. Smartphones offer new opportunities for education and mobile and computing tools.

**Keywords:** Mobile applications, nutrition, diet, calorie counting, fitness

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## “m-Health Can Improve Alzheimer Management”

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**Background:** Alzheimer's disease is one of the most prevalent chronic neurocognitive disorders. Advances in Mobile health are proving to be extremely conducive to the effective management of Alzheimer's patients.

**Objectives:** The main purpose of this study is to review the effectiveness and efficiency of m-Health in supporting Alzheimer's patients and the caregivers.

**Materials and Methods:** PubMed, Google Scholar and Web of Science using the keywords telemedicine, mobile health, m-health, e-health, Alzheimer disease and dementia were searched with the purpose of finding related articles. According PRISMA ۱۲۰ papers were collected, which ۸۰ papers were removed in more detailed reviews and ۴۰ articles were approved in last assessments.

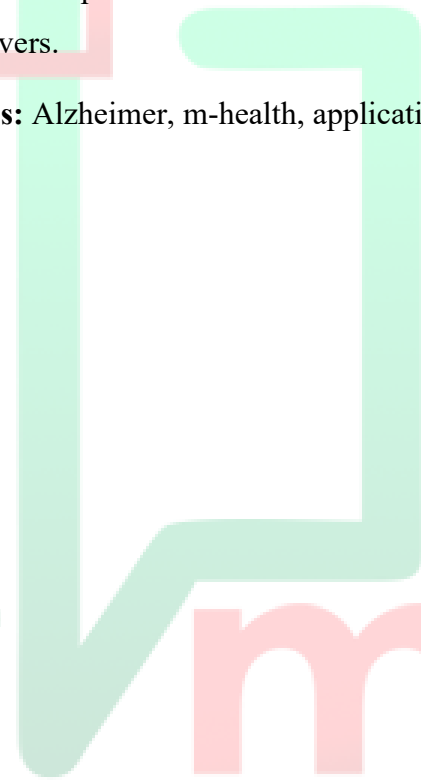
**Results:** Based on the results, there were four main goals of the articles: disease management, skills training, treatment and awareness promotion. Applications and gadgets based on graphics have demonstrated better performance, lower workload

and faster response times than text-based relationships. Utilizing telephones, video games, virtual reality, as well as telemedicine improves cognition, memory, brain activity, language, depression, quality of life, and mental health. Another benefit of m-health was the reminder of medicines and interdisciplinary care provided to patients by different caregivers.

**Conclusion:** 88% of the reviewed articles show positive results, acceptable effectiveness and improvement in the quality of care due to the use of m-health in the care of Alzheimer's. The remaining 12% consider that features to be insufficient and believe more improvements are needed in this field. Eventually, m-Health has the potential to provide efficient healthcare facilities for the disabled and support for caregivers.

**Keywords:** Alzheimer, m-health, application

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## “Application of mobile health (mhealth) and virtual reality (VR) in learning anatomy in medical students: a systematic review”

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**Background:** Virtual reality is a powerful tool that has been increasingly used in anatomy education that makes it possible to visualize almost any part of the body.

**Objectives:** The purpose of this study is to show the effect of virtual reality in learning anatomy in medical students.

**Materials and Methods:** The present systematic review study has been analyzed by comprehensive literature search with a time range of 2010 up to December 13, 2022 was conducted in the following electronic databases: Web of Science, IEEE, Science Direct, OVID, Scopus, and PubMed. The protocol of this study followed the PRISMA guideline.

**Results:** from 124 found articles, 38 articles related to the study were selected. 21 articles (50,0%) used the case-control method, 9 articles (23,0%) used the focus group method, and 8 articles (21%) used the pre- and post-intervention method. 11 articles (29%) are related to learning the anatomy of the whole body, 3 articles (11,0%) are related to neuroanatomy, 3 articles (11,0%) are related to cardiovascular anatomy, and the rest are related to the anatomy of other organs. 34 studies found that the use of virtual reality improve students' anatomy knowledge, and all studies

stated that the use of this technology increase student satisfaction, improve learning, and increase their study motivation.

**Conclusion:** This systematic review shows that the use of mobile health and virtual reality in anatomy education improves students' learning, increases their knowledge of anatomy, and their motivation and satisfaction.

**Keywords:** Virtual reality, Mobile health, Anatomy, Medical student



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## “Mobile Health Interventions for Shared Decision Making: a Literature Review”

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**Background:** Shared decision making (SDM) is a process in which healthcare providers share the best available evidence about healthcare with patients, and patients can make informed decisions based on their values and preferences. Mobile health (mHealth) may help SDM by facilitating information sharing, increasing access to care, and improving SDM opportunities.

**Objectives:** The purpose of this study was to review mHealth interventions for SDM and to determine the goal and effectiveness of these interventions.

**Materials and Methods:** The Web of Science, Scopus, and PubMed databases were searched on November, 6<sup>th</sup>, 2022. Included articles were original observation and intervention studies that used mHealth for SDM. Data such as the first author's

name, country, type of disease, objectives, and outcomes of the study were extracted from relevant articles.

**Results:** The number of 31 articles out of 640 were included in this review study. Most of the studies were conducted in USA (N=14, 45%). The most application of mHealth for SDM was in mental disorders (n=6, 19.3%) and musculoskeletal diseases (n=6, 19.3%). The main purpose of the studies was to assess users' satisfaction (n=10, 32.2%) and usability (n=10, 32.2%). In most of the studies (n=30, 96.8%) mHealth for SDM has positive outcomes, except for two studies (6.5%) that reported negative clinical outcomes and usability outcomes.

**Conclusion:** This study showed that mHealth can help SDM at different stages of the care process. Therefore, healthcare providers can use this available technology to choose the best medical practice in collaboration with patients.

**Keywords:** Shared Decision Making, Mobile Health, mHealth, SDM

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## “Testing a New Proposed Technology Acceptance Model in Mobile based Computerized Physician Order Entry in Cardiac Care Unit”

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**Background:** Several theoretical models have been proposed to evaluate and explain the acceptance of ICT. In health technology acceptance, previous studies have confirmed the use of TAM and UTAUT. However, these models still have limitations in their predictive power, and future technology adoption research should develop more robust theoretical models.

**Objectives:** We attempted to investigate a new model, proposed by Safdari et al, to use a computerized physician order entry system and propose it for future studies in the same clinical settings if appropriate in the research setting.

**Materials and Methods:** In this descriptive-analytic study, model dimensions were derived from Safari's research and were evaluated by a researcher-made questionnaire. The data collected by 200 questionnaires from cardiac care units of four teaching hospitals of Shiraz University of Medical Sciences. The model tests

were done by LISREL software in Absolute, Comparative and Adjusted fit indicators.

**Results:** Most of the fit indices were completely within the acceptable or close to the acceptable range. The model's appropriate design with the technology application environment has made the model fit successfully.

**Conclusion:** According to the model successful fitting, the model proposed by Safdari et al. has the capacity to be used in the feasibility of mobile technology adoption in health care environments. Note that every mobile health technology may require the investigation of other factors that researchers should be consider, according to the characteristics and intended environment for use.

**Keywords:** Technology Acceptance Model, Fitness of the model, Cardiac Care Unit, Computerized Physician Order Entry system.

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## **Persian diet mobile application:app evaluation study**

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**Background:** Despite the increasing number of diet mobile apps and their effect on patients' decisions, the quality and functionality of these apps are understudied.

**Objectives:** This study was conducted to evaluate the quality, functionality, and of Persian language diet mobile apps.

**Materials and Methods:** Persian language diet mobile apps were searched in the android and iOS App Stores using relevant keywords including diet and nutrition. 30 out of 194 apps met the inclusion criteria. six evaluators assessed their quality based on the Mobile App Rating Scale (MARS).

**Results:** The mean MARS score of the apps was 4.02 out of 5. Among the four engagement, aesthetics, functionality, and information quality dimensions,

functionality had the highest mean score (3.54) followed by aesthetics (3.17), engagement (3.11), and information quality (2.27).

**Conclusion:** The diet mobile apps had drawbacks like lack of engagement strategies, lack of evidence-based information for patients, limited guideline-based self-management functionalities, failure to evaluate clinical effectiveness in clinical trials, and lack of mutual communication with healthcare providers.

**Keywords:** Evaluation, Quality, Mobile apps, Diabetes, MARS



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## “Persian mobile applications for managing diabetes and hypertension: The actors need more control”

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**Background:** The number of available apps related to hypertension and diabetes and their usage by smartphone owners is constantly increasing. However, the most applications lack standardization and scientific validation. These aspects yet still underrated issue.

**Objectives:** The objective of this study was to investigate the Persian mobile applications related to patients with diabetes and hypertension

**Materials and Methods:** This study was conducted on all Persian mobile apps related to diabetes and hypertension in ۲۰۲۲. The mobile applications were searched in the Café Bazaar and Myket app store using the keywords such as “diabetes”, “blood sugar” and “blood pressure”.

**Results:** In total, ۱۲۲ Persian mobile applications were investigated. Major app functionalities were general information on diabetes and hypertension, tracking (for diabetes, blood pressure, pulse, weight, body mass index and ...). A total of ۷۲% of the apps contained general information, ۳۷% had tracking function, and ۲۲% had tools to enhance medication adherence. around fifty percent of apps had more than

1000 download rate. six of these apps were developed by healthcare agencies such as universities or professional organizations and had any documentation of validation against a gold standard.

**Conclusion:** Consumers have a strong tendency to download and favorably rate apps, despite a lack of validation for these apps. There is a need for greater oversight in medical app development for diabetes and hypertension.

**Keywords:** Diabetes mellites, High blood pressure; mobile health; self-management; Evaluation



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## “The clinical effectiveness of Telemedicine in Iran: A systematic review of clinical trial”

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**Background:** Telemedicine has been utilized increasingly worldwide; few studies assess effectiveness of telehealth in Iran.

**Objectives:** study aimed to systematically evaluate the evidence on the effectiveness of telemedicine services used among patient with different health conditions in Iran.

**Materials and Methods:** Studies were obtained from the PubMed, Scopus, Google scholar, Sid, and Iranmedex on May, ۲۰۲۲. We followed the PRISMA guidelines.

Titles and abstracts of all randomized controlled trials were independently screened based on the eligibility criteria. full texts were retrieved and extracted.

**Results:** In total, 28 articles met the inclusion criteria. The number of participants in all studies was 3209. The health conditions that were assessed included diabetes (8/28, 28.6%), hypertension (4/28, 14.3%), heart disease (4/28, 14.3%), renal disease (2/28, 7.1%), pregnancy care (3/28, 10.7%) other studies were on interferon therapy, oral health, cerebral palsy, pain management, maternal care, PTSD, and ASD care. The telemedicine approaches that were used included SMS (4/28), web-based interventions (4/28), patient and doctor videoconferencing visits (3, 3/28%), telephone counseling (11/28), and applications (4/28%), and PDF, DVDs and others (2/28%) The telemedicine interventions in all included studies resulted in outcomes that were comparable to or better than the outcomes of control groups. These outcomes were related to symptom management, quality of life, satisfaction, medication adherence, and disease progression.

**Conclusion:** Although more research is needed, according to the literature, telemedicine services can be implemented in the management of some patients in Iran. Patients, health care professionals, and caregivers may benefit from using both telemedicine services and traditional, in-person health care services.

**Keywords:** Telemedicine, Effectiveness, Self-management, Satisfaction



**“Design and evaluation of "smartphone-based program for the care of patients with pacemakers" for nurses working in special cardiac care units of selected hospitals of Isfahan University of Medical Sciences, 2023”**

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**Background:** According to the range of use of pacemakers, nurses of heart departments should be familiar with the use cases of this device and they must aware about the potential risks and problems that may occur in the care of these patients and pacemaker performance disorders

**Objectives :**The aim of this study was to design a smartphone-based program to facilitate the training of nurses for the care of patients with pacemakers

**Materials and Methods :** In order to train nurses, after need assessment and validating the contents prepared by experts, 8 multimedia were prepared in the field of caring for patients with pacemakers, of which 2 files were in pdf format, 3 files were in video format and 3 files were designed and edited in the form of a podcast. The quality of the designed application was evaluated by Fredmal questionnaire. The data of this research is of quantitative type and SPSS software version 16 and descriptive statistical methods will be used to analyze the data.

**Results:** The results showed that out of 102 participants, 97 people, equivalent to 95%, gave an excellent grade, 3 people, equivalent to 3%, gave a good grade, and 2 people, equivalent to 2%, gave an average grade to the smartphone-based program for the care of patients with pacemakers, and no one, did not give a poor score to the smartphone-based app for the care of patients with pacemakers.

**Conclusion:** The smartphone-based program for the care of patients with a pacemaker has been useful and practical for nurses working in special cardiac care units.

**Keywords:** : Mobile Applications, Pacemaker, artificial, Nurse, Heart, Education

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## “The Effects of Dietary Mobile Apps on Nutritional disorders: A Systematic Review”

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**Background:** Recent advances in technology and increased access to mobile phones have made people pay more attention to building different software. Studies have shown that the use of these applications has a positive effect on the treatment of diseases. This study was conducted with the aim of examining the available applications related to eating disorders and their treatment.

**Objectives:** The aim of this review is to assess the effects of the use of dietary mobile apps on nutritional disorders.

**Materials and Methods:** A systematic review was conducted following PRISMA guidelines using PubMed, scienceDirect, and Web of Science databases. Intervention studies evaluating the nutritional disorders of dietary apps, published in English between January 1, 2012 and November 2, 2022 were included. The methodological quality of included articles was assessed via the Academy of

Nutrition and Dietetics' Quality Criteria Checklist: Primary Research. Finally, the data were analyzed using descriptive statistics (frequency-mean) by SPSS<sup>20</sup>.

**Results:** Upon completion of the searches, 18,900 articles were identified, and data were extracted from 10 articles. Nourish App had the highest satisfaction among patients with eating disorders. This app is based on the specialized clinical management of chronic diseases and obesity and has caused weight loss in more than 80% of patients.

**Conclusion:** This review indicates that dietary mobile apps are effective self-monitoring tools, and that their use results in positive effects on measured nutritional disorders, especially weight loss.

**Keywords:** Dietary mobile apps, Mobile apps, Nutrition intervention, Nutritional disorders.

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## “Design of Electronic Stethoscope with tele-auscultation system”

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**Background:** Due to the high mortality and morbidity of cardiovascular disease and with regard to the spread of COVID-19, portable digital health monitoring devices and tele-auscultation may play an important role in the accurate and early diagnosis and monitoring of cardiovascular disease.

**Objectives:** The study aimed to design a technology-based stethoscope for cardiopulmonary health monitoring to improve convenience, mobility, and durability and provide initial clinical data for more accurate and early diagnosis with a user-friendly device.

**Materials and Methods:** The designed tele-auscultation stethoscope contains 3 main stages after recording heart sound sensor (Electret Mic. Embedded in a stethoscope head connected shielded cable in rubber sleeve): 1) TL072 dual op-amp, 2) LM386 audio amplifier and 3) UA457 gain stage and load driver. As the main frequency components of the heart sound signal (PCG) are in the range of 20-100 Hz, 2nd order Sallen-key low pass filter (LFP) with 100 Hz cut-off frequency utilized to environmental noise cancellation. To send the captured PCG wirelessly

to remote center for further processing BLE module (HC-06) communicate with AVRmicrocontroller.

**Results:** A novel low-cost electronic stethoscope is designed and implemented for a replacement with conventional auscultation. As a clinical tool, phonocardiogram (PCG) recordings of heart sounds with -3 dB attenuation have many advantages over traditional auscultation, in that they may be replayed and analyzed for time and frequency information.

**Conclusion:** Smart Electronic Stethoscope with tele-auscultation is a promising remote monitoring device for structural defects diagnosis of heart reflected in heart sounds and enrich clinicians with valuable prognostic information.

**Keywords:** PCG(Phonocardiogram), Cardiopulmonary Health Monitoring, Electronic Stethoscope, Tele-auscultation, BLE(Bluetooth Low Energy)

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## A Solution based on nutrition informatics for improving food security in a developing country

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**Background:** Due to the increased price of foods in recent years and the diminished food security in Iran, nutrition recommender systems as a novel nutrition informatics technology can suggest the most suitable and affordable foods and diets to users based on their health status and food preferences to ensure their food security.

**Objective:** The present study aimed to design and evaluate a recommender system to suggest healthy and affordable meals and provide a tele-nutrition consulting system.

**Methods:** This applied three-phase study was conducted in 2019-2020. In the first stage, the food items' daily prices were extracted from credible sources, and accordingly, meals were determined in three price categories. After conducting a systematic review of similar systems, the requirements and data elements were

specified and confirmed by experts. In the second stage, the software was designed and developed based on the findings. In the third stage, system usability was evaluated by four experts based on Nielsen's heuristic evaluation.

**Results:** Initially, 72 meals complying with nutritional principles were determined in three price categories. Following a literature review and expert survey, 31 data elements were specified for the system, and the experts confirmed system requirements. Based on the information collected in the previous stage, the Web-based software TanSa in the Persian language was designed, developed, and presented on a unique domain. During the evaluation, the mean severity of the problems associated with Nielsen's 10 principles was 1.2, which is regarded as minor.

**Conclusions:** To promote food security, the designed system recommends healthy, nutritional, and affordable meals to individuals and households based on user characteristics. To improve access to nutritionists and enhance the nutritional status of society, this system also allows users to receive a tele-nutrition consulting system. Regarding the current conditions of Iran, nutritionists and researchers are recommended to use this system.

**Keywords:** Nutrition informatics; recommender systems; food security; meal

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## “Effectiveness of Digital Behavior Changes Interventions (DBCI) on Health Behavior Change in Obese and Overweight people : A Systematic Review”

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**Background:** Over the past decade, digital behavior changes interventions (DBCI) have been increasingly used for health behavior changes, to foster the self-management of obese and overweight people. However, the effectiveness of them varied in different studies due to quality of methodology.

**Objectives:** This study is a systematic review of articles to assess the effectiveness and best practice of digital behavior changes interventions for achieving health-related behavior changes in overweight and obese people.

**Materials and Methods:** We considered articles from MEDLINE, EMBASE, CINAHL, Cochrane, Scopus and PubMed data bases published from January 2000 to October 2022 in the peer-review journals. Out of 40 retrieved records from our electronic search, 16 studies were eligible and were included in this review.

**Results:** The Social Cognitive Theory and Health Belief Model were used as the theoretical basis in several studies. Duration of the interventions ranged from 3 to 6 weeks, but the effective studies lasted between 3-6 months. Physical activities (14 studies), adherence to medication (14 studies), and diet (12 studies) were the common health behavior outcomes that were assessed. Most studies (10) reported a significant improvement on adherence to medication, but two studies did not report a clear effect. Physical activity was significantly improved in obese in seven studies, whereas ten studies reports didn't mention a significant effect.

**Conclusion:** DBCI, have successfully improved medication adherence and consumption of healthy diet, but its role in improving physical activity was not conclusive.

**Keywords:** Behavior change, Digital behavior change, Behavioral interventions, Obesity

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**“Can social media usage affect the mental health and sleep in multiple sclerosis patients?”**

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**Background:** Social media usage has been increasing exponentially and integrated with daily lives. Most of the modern social media platforms create communities for sharing ideas and personal contents as well as providing information. Minority groups like patients suffering from chronic diseases usually seek medical information through internet. As this technology can affect users both positively and negatively, studying its impacts on vulnerable groups like Multiple Sclerosis (MS) patients seems beneficial.

**Objectives:** This study aimed at evaluating a population of Iranian MS patients to assess the effect of social media use on their mental health and sleep.

**Material and Methods:** This cross sectional study was performed on a sample population of 122 MS patients aged 11- 63 years who referred to physical medicine and rehabilitation clinics of Shiraz University of Medical Sciences. Baseline characteristics, social media usage questions, scales of positive and negative mental effects and sleeping disorder were all asked in the questionnaires. Data were analyzed using ANOVA, independent t-test, Fisher's exact test and Chi-square.

**Results:** Findings showed that demographic characteristics, screen time duration and devices used for network access did not have any significant associations with the patients' mental health and sleeping problems. On the other hand, there was no relationship between social media platforms including Whatsapp, Instagram, Telegram, Twitter, Youtube, blogs, and text message and the mentioned variables.

**Conclusion:** social media usage does not affect MS patients' mental health and sleep; however the limited impacts of media and the role of mood status should be considered.

**Keywords:** Social media, Social network, Mental health, Sleep disorder, Multiple sclerosis

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## “The upper limb disorders among Schoolteachers involved in E-learning During the Pandemic of COVID-19: : A Cross-Sectional Study”

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**Background:** Due to the COVID -19 pandemic, many people in the public sector, including teachers, have had to work remotely via social media. This may have contributed to their exposure to musculoskeletal pain.

**Objectives:** The purpose of this study was to investigate upper extremity disorders as a consequence of online teaching.

**Materials and Methods:** This cross-sectional study involved 410 teachers (75% male and 25% female) with a mean age of 40.1 years working with telecommunications. Participants were asked to fill out an online survey that

included sociodemographic information, type of pain, location of pain, and a self-assessment of pain intensity.

**Results:** The majority of participants (92%) reported upper limb pain. Among the upper limbs, the shoulder was the most commonly affected joint, as 29% of teachers who had upper limb complaints reported pain in the shoulder. Teachers also reported pain sensations in different parts of the upper limbs as follows: 20% in the wrist, 14% in the hands, 12% in the arm, 8% in the elbow, and 8% in the forearm. In addition, 48% of teachers reported that they rarely exercise.

**Conclusion:** Despite telecommunications helping teachers to stay healthy by reducing the risk of infections, they also impose new requirements on the workplace that can endanger the health of workers. Preventive factors, such as upper limb exercises during remote work or the provision of an ergonomic environment by health policy makers, can also help reduce the risk of musculoskeletal disorders.

**Keywords:** Upper Limb Pain, Teleworking, School Teachers, Social media

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## “Prediction of breast cancer using artificial intelligence tools”

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**Background:** Breast cancer is the most common cancer and the second cause of death in women worldwide. Thus, early and precise breast cancer detection could reduce mortality in the long term. Different techniques, such as mammography, and ultrasound, could be applied to breast cancer diagnosis. However, artificial intelligence (AI) tools help to identify chest abnormalities more efficiently and accurately.

**Objectives:** In this study, various models of AI are developed to predict breast cancer. Then the performance of the models is compared, and the best model is identified.

**Materials and Methods:** A dataset containing 1127 records was retrieved from Data PROM (Patient-reported outcomes) Baseline (2022). After preprocessing the dataset, Support Vector Machine (SVM), Naive Bayes, Decision Tree, Random Forest, Gradient Boosted Trees, K-Nearest Neighbors, and AutoMLP (Multi-layer



perceptron) classifiers were created and evaluated using 10-fold cross-validation. The performance of the models was evaluated in terms of accuracy, sensitivity, specificity, F-measure, and area under the receiver operating characteristic curve.

**Results:** The best performance was obtained using SVM classifier with an area under the curve (AUC) of 0.808 ( $\pm 0.030$ ), an accuracy of 88.72 ( $\pm 2.64$ ), a sensitivity of 82.90 ( $\pm 3.47$ ), a specificity of 73.41 ( $\pm 4.12$ ), and f-measure of 81.27 ( $\pm 2.30$ ).

**Conclusion:** Compared to similar studies, the findings obtained in this study have provided satisfactory results, indicating this model's high performance. Artificial intelligence techniques could be helpful in the prediction of breast cancer that results in omitting excessive diagnosis tests.

**Keywords:** artificial intelligence, breast cancer, diagnosis, prediction

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## “A New Platform of WBAN in Real Time Telemedicine and Healthcare Ecosystems to Manage the Covid-۱۹”

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**Background:** COVID-۱۹ growing challenges in healthcare ecosystems. Wireless Body Area Network (WBAN) in telemedicine is in interests of researchers, doctors and healthcare providers. Healthcare management by communication engineering and information technology have improved. Microsoft servers, Google search engine, virtual machine, etc. are the samples of real time telemedicine healthcare products.

**Objectives:** Expandable telemedicine healthcare ecosystems provide ubiquitous capability. These systems can share health information, medical applications, and fully automated, real time infrastructure. Telecommunication security and confidentiality of personal data exchange things increasing the confidence of users of telemedicine ecosystems. This paper presents a framework for telemedicine with cloud computing in platform of proposed WBAN.

**Materials and Methods:** Biosensors on/in/under the body measure the vital signs and bio signals carefully. Health information sending via WBAN to medical databases. In this research, ECG and EEG studding. Results simulating and comparing with the results of other researchers in MATLAB.

**Results:** The scientific work presenting consists of two steps. At first, it attempts to secure biosensors communications by several biometrics encryptions, by small size encryption scheme. Latter, Electronic Medical and Health Records (EMHRs) securely storing in the super hospital database cloud to maintain the confidentiality data after outpatient care in Corona Pandemic.

**Conclusion:** Analyzes show the proposed mechanism, it provides significant security through the random key generation mechanism.

**Keywords:** Real Time Telemedicine, Wireless Body Area Networks (WBANs), Cloud Computing Management, ECG/EEG or Vital Signs, Pandemic Corona (Covid-۱۹).

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## “Diet & nutrition-related mobile apps in the Iranian mobile apps store (Bazaar)”

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**Background:** Mobile applications are increasingly being used to support nutrition improvement. They could be effectively used for dietary intake assessment, weight management, physical activity monitoring, nutritional behaviors improvement, and nutrition education.

**Objectives:** The aim of this study was to investigate current nutrition-related mobile apps on the Iranian apps store (Bazaar) and review their characteristics.

**Materials and Methods:** This descriptive cross-sectional study was conducted on all Iranian mobile applications related to nutrition OR diet in 2022. Bazaar was used to search for nutrition-related applications using the following keywords: “diet”, “nutrition”, and their Persian translations. For each app, the extracted information was name, requirement for Internet connectivity, estimated number of

downloads, user satisfaction rate, developers, and the main features of each app. Data collected from application description and application developer's webpage.

**Results:** 36 mobile apps were identified from Bazaar app store. About 33% of them were developed by personal developers and 10 apps did not mention any specific developer. 22 applications were online and 14 applications were offline. Only 1 app could be used online/offline. In user satisfaction rate, 22 apps had 4-5 rating, and 14 apps had a rating of 3. Only 2 apps had under 3 rating.

**Conclusion:** Iranian apps on nutrition and diet are widely available and very popular but currently most of them lack professional and evidence-based content. Developing apps based on standard and evidence-based online approaches would assure content quality, allowing healthcare professionals to recommend their use by people.

**Keywords:** Mobile applications, Diet, Smartphones, Telemedicine, Nutrition

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## “Qualitative investigation of the suitability of educational application environment for the implementation of continuous training courses for doctors”

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**Background:** On average, every 4 to 5 years, 50% of medical knowledge loses its efficiency, and those working in this field must update their knowledge and skills by participating in continuous medical education programs, using electronic learning systems such as The mobile application provides the possibility of learning independently of time and place and with quality for the audience.

**Objectives:** Determining the subject of continuous education courses for the purpose of using interactive educational applications

**Materials and Methods:** A qualitative study was conducted at Shahid Beheshti University of Medical Sciences. The information related to virtual courses of basic and clinical sciences in the period of 2018-2020 were collected, coded, classified

and analyzed through literature review, statistical documentation review, observation and review of course content and platform, individual interviews and focus groups.

**Results:** clinical and non-specialized subjects were the most frequent, the majority entered the course in the evening and at night through smartphones. The educational objectives were mostly at low cognitive and non-transparent levels, and the main contents were audio and non-interactive slides, the dominant teaching method Lectures and evaluations were objective and comprehensive. Low graphical appeal, limited toolbox and low level of user interface interaction were other findings

**Conclusion:** Interactive application is a desirable option considering the job and time constraints of doctors and the need to receive easily and cheaply accessible knowledge so that the features of the appearance and graphics and how to learn the software are based on the needs and interests and based on the principles of educational design.

**Keywords:** continuous education, interactive application, subject classification

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## “Identifying the minimum data set for designing a mobile-based application for childhood obesity management.”

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**Background:** Designing mobile applications is one of the tools to increase the awareness of patients and the care team. A self-care application can be a good choice to help people gain awareness and improve treatment.

**Objectives:** The aim of the present study was to identify the minimum data set for designing a mobile-based application for obesity management in children.

**Materials and Methods:** In this descriptive-analytical article, data collection has been done by library and internet method. The research population included ۳۰ nutritionists who were selected by simple sampling. The research tool was a questionnaire that the researcher prepared in four sections: demographic data, evaluation data, treatment recommendations and practical capabilities. Validity and reliability were confirmed using content validity ratio (CVR) and Delphi method, respectively.

**Results:** The minimum data set (MDS) required for childhood obesity management was designed based on data from WHO guidelines and expert opinions. The

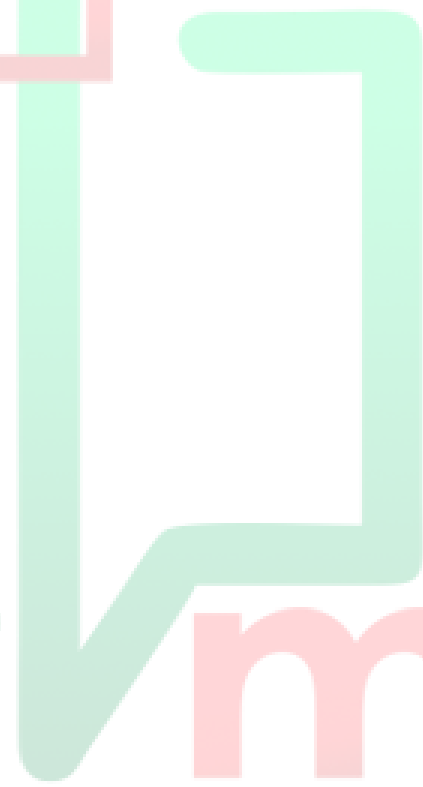


importance of this proposed MDS was calculated for demographic data 100%, assessment data 88,33%, treatment recommendations 97,67% and functional capabilities 88,94%.

**Conclusion:** Identifying the minimum data set for the prevention and control of obesity in children from the point of view of experts will be effective in improving applications in this field. This MDS has two data sections: The first part is used to understand the evaluation framework and use of treatment methods and the second part is used as the patient's personal file to store a set of data.

**Keywords:** Weight control, obesity, children, Application

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## “Mobile health(mHealth) in Organ transplant-A systematic Review”

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**Background:** With the rapid and widespread expansion of the availability and use of smartphones, mobile health (mHealth) has become a multipurpose therapeutic medium for the health care system.

**Objectives:** This study was conducted with the aim of investigating the use of telemedicine in organ transplantation.

**Materials and Methods:** In order to find the documents with the keywords (telemedicine, "mobile health", mHealth, digital Health, "organ transplant" and "organ transplantation") from medical subject headings-Mesh and with the opinion

of expert professors in this field, a search was carried out in the databases of Pubmed, WOS, Scopus and ProQuest in the period from the beginning of November 2022 to the end of November 2023. In order to screen the found articles, firstly, the titles found were reviewed by two researchers, and then the abstracts of the reviewed articles and quality articles were included in the study. The quality of the included articles was evaluated using Mixed Methods Appraisal Tool-MMAT tool by two authors.

**Results:** Of the 34 retrieved articles, 14 met our inclusion criteria. All articles were published from 2022 to 2023 and the trend of publications has increased in recent years. All eligible studies can be categorized into three groups: "diagnosis and treatment" (41%), "optimization of service quality" (50%) and "self-management at home" (9%).

**Conclusion:** MHealth systems show promise in improving patient engagement and self-management in organ transplantation. To gain acceptance from the health system and society as a whole, a program must be cost-effective, save time, improve chronic condition management, and reduce Medical errors.

**Keywords:** Mobile Health, Telemedicine, Transplantation, Organ

## “Telenutrition; a new way Nutrition Management Service-A Systematic Review”

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**Background:** A viable alternative in the telemedicine field to guarantee patient nutritional care is telenutrition. Telenutrition involves the interactive use of electronic information and telecommunications technologies to implement the nutrition care process with patients at a remote location.

**Objectives:** This study was conducted with the aim of investigating the use of telemedicine in nutrition management service.

**Materials and Methods:** In order to find the documents with the keywords (telemedicine, "mobile health", mHealth, digital Health, "Nutrition Assessment"

and "Telenutrition") from medical subject headings-Mesh and with the opinion of expert professors in this field, a search was carried out in the databases of PubMed, WOS, Scopus and ProQuest in the period from the beginning of 2007 to the end of 2022. In order to screen the found articles, firstly, the titles found were reviewed by two researchers, and then the abstracts of the reviewed articles and quality articles were included in the study. The quality of the included articles was evaluated using Mixed Methods Appraisal Tool-MMAT tool by two authors.

**Results:** Of the  $\wedge$  retrieved articles,  $\vee$  met our inclusion criteria. All articles were published from 2010 to 2022 and the trend of publications has increased in recent years. Digital health technologies can support the delivery of personalized nutrition care through the standardized Nutrition Care Process-NCP by using personal data and technology-supported delivery modalities.

**Conclusion:** Telenutrition may be regarded as an alternative to in-person evaluation offering anthropometric changes and nutritional goals similar to those reported through the in-person modality, in adult.

**Keywords:** Mobile Health, Telemedicine, Telenutrition, Nutrition

## “Mobile Messaging Application in the Management of Oral and Dental Problems in Covid-19 Crisis”

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**Background:** Mobile messaging applications are a cross-platforms that allow for the exchange of messages, images, audio, or videos using an internet connection.

**Objectives:** The aim of this paper is to recognize the uses of mobile messaging applications to manage patient with oral and dental problems during covid-19 pandemic.

**Materials and Methods:** This was a narrative review conducted in 2022. Three databases including ISI web of science, PubMed, Scopus, were searched from

2020 to 2022. Finally, 20 articles from 50 were selected which met our eligibility criteria and were included in this study.

**Results:** Result showed that, mobile messaging applications such as WhatsApp, Zoom, Line Application, Viber and Telegram were used to manage the condition of patients with oral and dental diseases during covid-19 pandemic. According to the results, mobile messaging applications have been used for different purpose including; continuing visits and care in COVID-19 pandemic, prioritizing high-risk patients while avoiding in-person contact in the pandemic, monitoring oral medical emergencies, management of oral medicine emergencies, provide clinical and supportive care to patients with oral diseases during pandemic, ordering routine blood tests, prevent increased morbidity of various dental and oral diseases due to delayed treatment during COVID-19, and consult on the prescription of antibiotics.

**Conclusion:** In general, mobile messaging applications have been used as an affordable and easily accessible platform for the general public and health care providers to continue to care for patients in covid-19 crisis, especially for patients with chronic condition.

**Keywords:** Mobile application, Covid-19, Messaging, Oral and dental diseases

## “A review of companion health approaches in eating disorders and weight management”

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**Background:** Nowadays, many people do not have the opportunity to meet with doctors and nutritionists due to their busy schedule. In the meantime, the availability of smart mobile phones, has the potential to facilitate healthy behavior change and weight management

**Objectives:** The present study aim was determine companion health approaches in weight management and nutritional disorders

**Materials and Methods:** This research was scoping review. Data was collected from keywords in Magiran, SID, Pubmed, Scopus, Web of Science, and Google Scholar databases in the period of 2015-2022. Documents were screened and selected based on the guidelines of preferred cases in regular review articles and meta-analyses (PRISMA).

**Results:** A total of 19 articles were reviewed. The results showed that various methods such as text message (SMS), multimedia messenger (MMS), online training programs, Fitbit Flex, telenursing and nutrition applications have been used. Among these, nutritional applications are welcomed due to their visual appeal, the possibility of measuring weight, BMI, counting calories, providing exercise, providing feedback, counting steps, monitoring sleep, or social functions such as communication and comparison with other users.



**Conclusion:** The approaches used for nutritional disorders and weight management are focused on 5 areas (problem identification, energy level calculation, healthy eating, lifestyle modification and weight management). Because the accompanying health can be used in patients with fatty liver, type 2 diabetes, hemodialysis, digestive disorders, morbid obesity, deficiency and overweight. It seems necessary to use standard software and monitor the accuracy of information by experts.

**Keywords:** Mobile Applications, Cell Phone, Nutritional disorders, Overweight



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## “The Perception of Laymen and Nutrition Experts Through Mobile Applications for Self-monitoring of Diet Based”

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**Background:** Due to the spread of the media and increasing requests to improve the standard of living, self-care has found a special place. One of the recently important self-care instruments is Nutrition applications.

**Objectives:** This study aims to explore the mobile applications influential in self-monitoring of diet based on Laymen and Nutrition Experts' attitudes.

**Materials and Methods:** In this original paper, a questionnaire was filled by 22 laymen & 9 experts who had used mobile dietary applications. The questionnaire analyzed using descriptive statistics and Spearman correlation with SPSS version 20.

**Results:** The results show that Laymen who use nutrition apps, their eating habits have improved. ( $p\text{-value} < 0.001$ , Spearman's correlation= $0.71$ ) While from experts' perspective, the use of nutrition apps is not effective in changing eating habits and managing diet. ( $p\text{-value} = 0.42$ )

**Conclusion:** This study suggested the use of mobile applications as a dietary monitoring tool and the need for improved mobile apps for self-monitoring. The results indicate that experts and the laymen have different views on the effectiveness of nutrition apps.

**Keywords:** Nutrition app, self-monitoring, Diet, Mobile Applications, Experts, Laymen.



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## “Applications of Mobile Health to control the COVID-۱۹ pandemic”

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**Background:** The COVID-۱۹ pandemic has been a massive challenge for governments and health systems. With the recent rapid advancement of technology, digital tools, particularly smartphones, are being used to address health-related issues.

**Objectives:** The goal of this review is to outline the applications of mobile health (m-health) in providing health services to control the COVID-۱۹ pandemic.

**Materials and Methods:** A systematic search strategy based on the PRISMA flowchart was used to identify m-health applications that were used to control the COVID-۱۹ pandemic. The terms "COVID-۱۹" and "mobile health" were used to search the PubMed database on October ۳۰, ۲۰۲۲. The inclusion criteria were English papers that used m-health technologies for the COVID-۱۹ pandemic. Papers that focused on eHealth and telehealth were excluded. Before being thoroughly read and included in the study, the gathered papers were first screened based on their title and abstract.

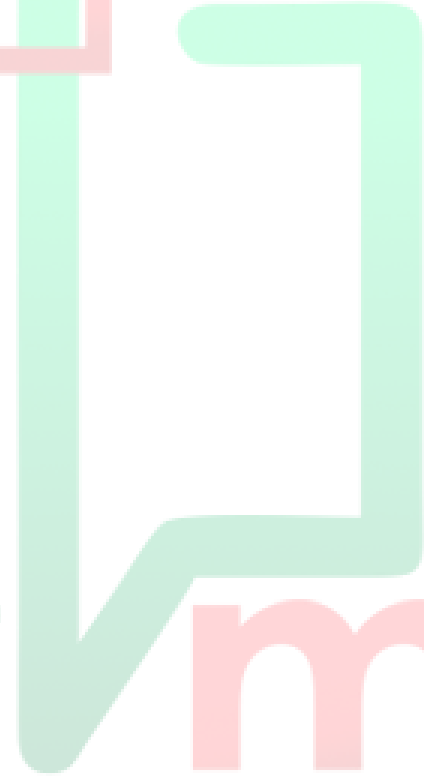
**Results:** The inclusion and exclusion criteria were applied to a total of ۴۰۴ papers, and only ۱۳ were ultimately included. There are many ways to use m-Health, including text

messaging, wearables, telehealth, biosensors, and mobile applications. Applications of m-health include education, contact tracing, screening, prevention, diagnosis, surveillance, and individual monitoring.

**Conclusion:** According to the findings, global technological advancements and the massive amount of data generated have made it possible to use m-health to control pandemics and crises. Furthermore, the COVID-۱۹ pandemic was significantly under control thanks to m-health.

**Keywords:** COVID-۱۹, Mobile Health, eHealth, Pandemic

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## “Application of Mobile Health for Diagnosis of Dementia and Other Cognitive Disorders in Older Adults”

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**Background:** The number of people with dementia is increasing dramatically as the population ages. With increasing use of mobile technology specially smartphone, using mobile-based cognitive tests can be effective approach in cognitive assessment of older adults and early detection of cognitive impairment.

**Objectives:** The aim of this study is to review mobile apps for diagnosis of dementia and other cognitive disorders.

**Materials and Methods:** We searched Web of Science, ProQuest, PubMed, Scopus and Cochrane by using related keywords such as "dementia", "mobile app", and "cognitive test". After removing duplicate articles, we screened title, abstract, and then full text of studies based on the inclusion and exclusion criteria.

**Results:** Out of 1388 articles initially identified, 19 were eligible for inclusion. Ten apps were developed based on existing paper based neuropsychological tests. Nine apps were new and innovative cognitive tests. The diagnostic performance of mobile apps for dementia and cognitive impairment was over 90%. BHA and CADi had the highest sensitivity with 100% and 96%, respectively. the VSM and BrainCheck had the highest specificity with 94%.

**Conclusion:** Mobile apps facilitate cognitive assessment and diagnosis of dementia and other cognitive disorders. During the outbreak of the COVID-19 pandemic, using these apps can play a significant role in continuous and remote cognitive assessment of older adults. Using artificial intelligence approach and novel digital health technologies such as virtual reality and chatbots, can improve reliability and usability of cognitive test apps and will set a bright future in detection and better management of cognitive disorders.

**Keywords:** mHealth, mobile health, digital health, dementia, cognitive disorder

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## “Mobile Health in Management of Gastrointestinal Diseases: Opportunities and Challenges”

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**Background:** With the advancement of technology and the ubiquity of mobile device and smartphone, people have started using mobile applications for various health needs. For patients with gastrointestinal diseases, using of mobile health can promote improved quality of care delivery and clinical outcomes.

**Objectives:** the purpose of this study is to investigate the application and challenges of mobile health in management of gastrointestinal disease.

**Materials and Methods:** We searched Web of Science, PubMed, Scopus and Google Scholar by using related keywords such as “gastrointestinal disease”, “digestive disorder”, “mobile app”, and “mobile health”. Relevant studies have been selected and reviewed based on the specified inclusion/exclusion criteria.



**Results:** Mobile health has various applications in management of gastrointestinal disease, including Information dissemination, patient education, virtual visit and communicate with health care providers, patient monitoring and tracking, and reminder and alarms. Based on the review, there are some challenges and limitations in utilizing mobile health in the care of these patients, including privacy and confidentiality issues, smartphone accessibility, e-health literacy, lack of health care professional involvement in the design of mHealth apps, usability issues, limited evidence related to validity, accuracy and clinical outcomes of mHealth apps, user acceptance and insurance reimbursements.

**Conclusion:** Mobile health can be effective in managing digestive disease and improving self-management, patient empowerment and quality of care delivery. Despite the advantages and capabilities, there remain some potential challenges and limitations that need to be investigated and addressed.

**Keywords:** mHealth, mobile health, digestive disorder, gastrointestinal disease

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## “The Challenges of Mobile Health in Achieving Health Equity during The COVID-۱۹ Pandemic”

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**Background:** The expansion of digital health services particularly mobile health during the COVID-۱۹ pandemic has drawn increasing attention to the impact of the use of mobile technologies and smartphone on health equity. Although mhealth has the potential in achieving health equity, but can sometimes lead to increase health disparities.

**Objectives:** The purpose of this paper is to examine the challenges of mobile health in achieving health equity during the COVID-۱۹ pandemic.

**Materials and Methods:** We reviewed of literature on mobile technology and health equity during the COVID-۱۹ pandemic. Scopus, Web of Science and Google Scholar were searched by using related keywords such as “health equity”, “health disparities”, “mobile health” and “COVID-۱۹”. After removing duplicate articles, relevant studies have been selected and reviewed based on the specified inclusion/exclusion criteria.

**Results:** There are disparity determinants in mobile health which includes age, income, education level and geographical position. The mobile health challenges in

health equity were categorized in 4 groups that including individual (insufficient digital health literacy), organizational (absence of trained healthcare providers), technical (lack of access to mobile devices and internet), and governmental (Inappropriate funder and reimbursement models).

**Conclusion:** Mobile health technology can be effective in providing equitable services to people during outbreak pandemics and disaster conditions such as Covid-19. In order to achieving health equity and benefit from mobile health services, the government and health policy makers need to take measures such as developing ICT infrastructure, creating strategies related digital health literacy, awareness and education of community members, and reforming insurance policies.

**Keywords:** mobile health, mhealth, health equity, health disparity, digital health

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## “Evaluating The Impact Of Improving Self-Care Of Kidney Transplant Patients using KTPHR Application”

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**Background:** Kidney transplant (KT) patients are often faced with multiple chronic diseases, and this significantly increases the complexity of managing disease in patients. Management of KT patients include regular monitoring of blood pressure, weight, fluid intake, and cholesterol and blood sugar levels. The personal health record (PHR) is proposed as one of the self-care tools to deal with the life challenges of patients with KT.

**Objectives:** This study was conducted with the aim of evaluating the impact of improving self-care of KT patients using KTPHR.

**Materials and Methods:** In this study, the data recorded by eight KT patients under active medical treatment who used KTPHR during one month were analyzed. The KTPHR app is a mHealth solution where KT patients can manage their disease-related health information. The structure of this application is based on the review

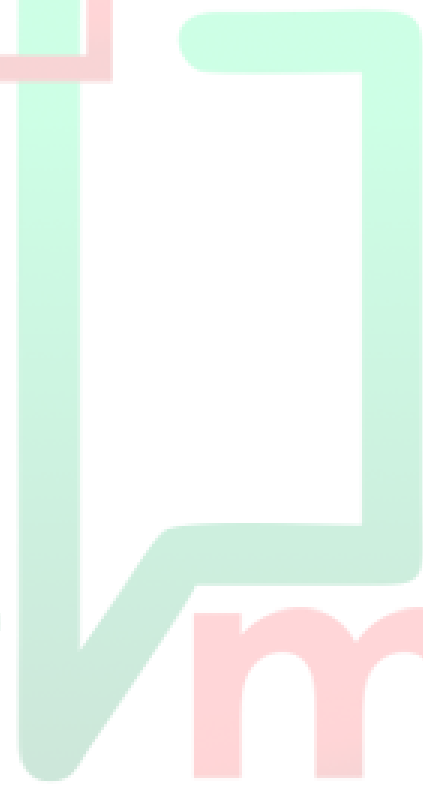
of reliable sources, including articles, reports, standards and guidelines of international organizations.

**Results:** The results of the evaluation showed that patients paid more attention to their lifestyle and adhered to their medications during the use of KTPHR. Also, the comparison of laboratory factors before and after the use of KTPHR showed that it is close to the desired value.

**Conclusion:** The use of mHealth solutions for self-care of KT patients, such as KTPHR, increases patient empowerment and engagement in disease management.

**Keywords:** Personal health record, Kidney transplant, Self-care, Mobile Health

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## “Developing the minimum data set for designing kidney transplant personal health records (KTPHR) applications”

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**Background:** Kidney transplantation (KT) is considered the best choice of treatment for ESRD patients. Improved self-care for KT patients can be achieved through the Personal Health Record (PHR). Since there is no single standard model for developing KTPHR in Iran, it is necessary to collect the standard minimum data set (MDS).

**Objectives:** This study aimed to establish a MDS for designing KTPHR applications.

**Materials and Methods:** This study was conducted in three phases. In the first phase, a literature review was conducted to identify the potential data items for designing the initial KTPHR model. at the second phase the validation of the model was fulfilled using the content validity ratio (CVR) and content validity index (CVI), with the help of experts as well as medical informatics and health

information-technology and laboratory clinical doctors and nephrology specialists. In the third phase, the final MDS was created design KTPHR.

**Results:** After the literature review, only 36 sources were selected. First, to determine the structure of PHR, data classes and sub-classes of existing resources were extracted and assigned to appropriate categories for scoring. Then, by examining the questionnaire and determining the validation, the KTPHR model was designed. Finally, according to the content of the entered studies and based on the obtained CVR, 11 main classes were determined for KTPHR design.

**Conclusion:** The development of an MDS, as the first and most important step towards developing KTPHR applications, can evolve a standard and comprehensive basis for data collection, reporting, and analysis of KT patients.

**Keywords:** Personal health record, Kidney transplant, Self-care, Minimum Data Set

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## “Conducting context analysis for designing a smart virtual clinic platform (SVCP)”

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**Background:** The smart virtual clinic platform (SVCP) is an infrastructure for interaction between providers and patients, which creates an effective way to provide high-quality services using emerging technologies by managing supply and demand. Since these solutions are emerging rapidly, in order to successfully implement them, it is necessary to conduct a context analysis to better understand the most relevant requirements and services.

**Objectives:** This study aimed to conduct a context analysis of the platform ecosystem that will drive the design of SVCP.

**Materials and Methods:** First, the context in which SVCP has an impact and the people affected by SVCP were analyzed through the literature review. In the second phase, after determining the platform's goals and framework, the use cases of SVCP were identified. Accordingly, in the third phase, the functional and non-functional requirements of SVCP were extracted. In the fourth phase, the requirements were translated into a framework of reusable functional components, and in the last phase, the proposed functional framework was validated using a semi-structured interview and content analysis method.



**Results:** Based on the context analysis SVCP can provide various solutions for preventive, diagnostic, and therapeutic purposes. Accordingly, the proposed functional framework approved by experts was presented in three groups including core services that are reusable by others, operational services including seven main parts, and value-added services.

**Conclusion:** The context analysis results provided interesting insights into the requirements and components of SVCP. The proposed functional framework can be used as a basis in other similar contexts.

**Keywords:** Digital Platform, Context Analysis, Requirement Engineering, Telemedicine, Virtual Care

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## “Designing a privacy-preserved Health Recommender System for treating Non-Alcoholic Fatty Liver Disease using Federated Learning”

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**Background:** Patients with non-alcoholic fatty liver disease (NAFLD) need an organized exercise schedule and proper diet in addition to medication. The presented system is a recommender system designed for health plan suggestion to improve the treatment process of patients with NAFLD.

**Objectives:** Our main objective is designing a privacy-preserved health recommender system for NAFLD patients which considers three parameters: local features, temporal conditions and individual interests.

**Materials and Methods:** First, basic information including the type and volume of diet and exercise is collected from users through either the website or application. In this system, people's health information is not transmitted, so data processing is performed on the user's end and the results are sent to a local server as a model. This system, which is a distributed system using federated learning, receives all the locally obtained models, classifies them based on the local and temporal parameters, and sends out the most suitable diet and exercise schedule to the end users via the recommender system. It has been run with a software tool called Fate.

**Results:** Our system for non-alcoholic fatty liver patients suggests a suitable exercise and diet health plan based on their habitat and personal interests. Federated

learning could guarantee the protection of the users' medical information. Therefore, they would not be concerned about the disclosure of their information and they would participate with more honesty.

**Conclusion:** This system can improve the treatment process of non-alcoholic fatty liver patients.

**Keywords:** Fatty Liver, NAFLD, Recommender System, Federated Learning.



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## “mHealth classification: a survey of mobile health applications”

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**Background:** The World Health Organization published an article discussing barriers to implementing mHealth technologies into health practices. Of those identified, lack of knowledge was the second highest rated barrier to implementation. Research and publication of reliable findings is needed for all identified barriers. Categorizations of available medical applications in meaningful groupings with definitions with intended purpose of uses have not yet been suggested.

**Objectives:** The aim is starting point for organizing mHealth information in a way that promotes user knowledge and understanding of the various components of the domain.

**Materials and Methods:** In order to review previous researches systematically, PRISMA has been used in this paper.

**Results:** Although we have determined that most of the applications will comfortably belong to a dimension, there are opportunities for application developers to allow their products to operate in multiple dimensions by removing or adding certain features to their product offering

**Conclusion:** By understanding the purpose of the application and the position in the above taxonomy, along with the role it plays in the wider infrastructure, we can begin to understand the significance and consequences of groups of applications.

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**Keywords:** mHealth †Mobile health †Digital health



## “Evaluation of Machine Learning Methods to Predict Alzheimer's Disease: A Systematic Review”

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**Background:** Alzheimer's disease (AD) is one of the most important causes of death in the elderly, and is affected approximately 1 of every 9 people over 60 years. Timely diagnosis of brain structural changes plays a role in the early prediction of this disease. Automatic diagnosis of diseases has become possible with the machine learning methods.

**Objectives:** The purpose of this study was to evaluate machine learning methods for predicting Alzheimer's disease.

**Materials and Methods:** This systematic review was conducted in 2023 by searching for keywords in the title, abstract, and keywords of the studies in the reliable databases of Web of Science, Scopus, PubMed, and Google Scholar without a time limit.

**Results:** A total of 2600 articles were searched, and after checking the full text of the articles, 22 articles were included in the study. According to the reviewed articles, machine learning techniques provide a powerful tool to discover detailed and complex features of MRI images, and the use of information from these images is considered an automatic method in predicting Alzheimer's disease. Using genetic information and Alzheimer's disease with machine learning methods is more accurate than using plasma protein levels in the early diagnosis of this disease. Also, findings of this study showed that people who had high scores in emotional distress were at a relatively high risk of suffering from dementia.

**Conclusion:** According to the study findings, it can be said that machine learning prediction models can be effectively used to the early prediction of Alzheimer's disease.

**Keywords:** Machine Learning, Prediction, Alzheimer's Disease

## “Investigating the role of Mobile Health in Autism self-care education: a systematic review”

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**Background:** Recent studies show that people with autism have a shorter life span than other people. The complex nature of autism requires a range of services exist in different departments person's life. However, research has shown that people with autism and their families often experience barriers to accessing autism-related services and support. Self-care programs empower people to deal with diseases and improve their quality of life.



**Objectives:** The purpose of this study was to determine the role of mobile health in self-care autism.

**Materials and Methods:** This study was a systematic review that was conducted in 2022. This study was conducted by systematically searching and retrieving published articles without a time limit in reliable databases such as PubMed, Web of Science, Scopus, and Google Scholar search engine and associated with health, autism disease, and self-care education. The screening was done by checking the titles, abstracts, and then the full text of the articles by 3 people and checking the quality of the articles.

**Results:** Finally, 6 articles were selected based on the desired criteria. The interventions used in these studies were a video game, a self-monitoring application, an educational application, and a multimodal messenger. Also, in all studies was reported mobile health intervention had a significant effect on self-care education for autism and improved their social skills.

**Conclusion:** The findings of this study clearly showed that a self-care program using mobile health technology was effective in autism.

**Keywords:** mobile health, self-care education, autism disease.

## “Knowledge and perception of Physicians towards Telemedicine Technology”

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**Background:** COVID-19 pandemic has catalyzed to accelerate of the overall adoption and rapid expansion of telemedicine. However, the use of telemedicine is still limited. A proper understanding of telemedicine technology by physicians is an important requirement for the successful implementation of telemedicine.

**Objectives:** To investigate physicians' knowledge and perception of telemedicine.

**Materials and Methods:** This study is a cross-sectional-analytical study that was conducted in 2021 on 50 physicians who worked in a hospital in Taft, Yazd. Data were collected using a five-score Likert-scale questionnaire with seven parts. The validity and reliability ( $\alpha = 0.93$ ) of the questionnaire have been confirmed in a previous study. Data were analyzed by SPSS, using descriptive statistics, Pearson correlation, and Chi-square.

**Results:** 98% of physicians had low or average knowledge of telemedicine. It is not related to their age, gender, and service history. The need for continuous training (3,72), saving physicians' time (3,8), disrupting the doctor-patient relationship(3,98), the need to use new techniques (4,14), the importance of ease of use of telemedicine technology in facilitating its learning (4,2) and the need of telemedicine to be supported by physician community (4,4) have obtained the highest score among the expressions of each part. There is a positive and significant correlation ( $P < 0.01$ ) between the physicians' perception of ease of use and physicians' perception of necessity.

**Conclusion:** The knowledge and level of familiarity of physicians with telemedicine, its benefits and tools, and instructions are not enough. As Telemedicine technology needs the support of physicians, it is necessary to improve the knowledge and awareness of physicians about this technology with continuous training.

**Keywords:** Telemedicine, Physicians, Perception, Knowledge

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## “Investigating the role of Mobile Health in the treatment of Bulimia Nervosa disorder: a systematic review”

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**Background:** Bulimia Nervosa (BN) is a type of eating disorder characterized by uncontrolled episodes of overeating. Cognitive-behavioral therapy (CBT) is the first line of psychotherapy for BN. The more common method of treatment, which is face-to-face (FTF) with a specialist, limits access to treatment. Latterly, the use of technology-based interventions (TBIs) for the treatment of eating disorders has increased and is considered a new treatment strategy.

**Objectives:** The purpose of this study was to investigate the effectiveness of the TBIs method compared to FTF in CBT of BN.

**Materials and Methods:** The present study was a systematic review conducted in December 2022. The articles were identified through searching in the reliable databases using the keywords Mobile Health, Mobile Application, and Bulimia Nervosa.

**Results:** A total of 94 articles were searched and 12 articles were included in the study. Most patients in these studies confirmed the advantages of TBIs, including affordability, ease of access, and reviewing educational-therapeutic materials. TBIs had the highest efficiency due to providing feedback on progress, clinician support, cognitive restructuring, mood-boosting strategies and symptom monitoring. Besides these benefits, concerns were also reported regarding the accuracy of the information provided and privacy of the shared data. The urgent need for changes in the provision of treatment has become more apparent after the Covid-19 epidemic.

**Conclusion:** TBIs is a promising alternative to more specialized treatment in the field of eating disorders. Future studies should focus on the implementation of treatments based on TBIs to increase access to therapeutic care.

**Keywords:** Mobile Health, Bulimia Nervosa, Telemedicine, Mobile Application

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## “Mapping and analyzing virtual reality in health care”

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**Background:** virtual reality (VR) presents new possibilities for application in health care. Health care professionals can now immerse their patients in environments to achieve exposure to a specific scene or experience.

**Objectives:** The aim was to a scientometric review for Mapping and analyzing virtual reality in health care.

**Materials and Methods:** Electronic databases of PubMed, Scopus, Web of Science and Google scholar (December ۲۰۲۲) were searched and the received articles were analyzed using the software CiteSpace was mapped and analyzed.

**Results:** Of a total of ۴۷۵ records initially retrieved. The summary highlights major clusters first, including citing articles and cited references. The network consists of ۱۴ clusters.

**Conclusion:** VR has a promising future in health care, both in research and commercial realms. As many of the studies examined are still exploring the feasibility of VR for acute treatment of health conditions.

**Keywords:** Virtual Reality, health care, Mapping

## “Augmented Reality in m-Health; State of the Art”

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**Background:** The advent of Augmented Reality opens-up new horizons for the promotion of m-Health. Augmented Reality refers to the technology in which images of virtual objects and/or other digital information are superimposed over the real time view of the physical objects providing a composite view with guides for carrying out a task with or on the physical objects.

**Objectives:** The purpose of this review was to provide a comprehensive overview of these innovational technologies integration.

**Materials and Methods:** This study is a review, the state of the art. We applied MeSH Terms such as: Augmented Reality, Telemedicine and Medicine by Boolean operators in databases including: IEEE Xplore, ISI-web of science, Pub Med, Scopus, Science Direct and Google Scholar from 2020 to the present. The obtained articles synthesized in accordance with the study goal.

**Results:** we reviewed the literature and found that several horizons in m-health can be supported by augmented reality such as: diagnosis and treatment of disease, medication adherence applications, health care management applications, medical education, primary health care and public health services, rehabilitation and palliative care applications, health games and finally simulation of surgeries.

**Conclusion:** As the results showed, the integration of augmented reality and m-health makes appropriate opportunities for improvement in precision medicine and health promotion. Therefore, the development of this hybrid technology requires the comprehensive attention of health policymakers and digital health business developers.

**Keywords:** Augmented Reality, Telemedicine, Medicine.



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## “Machine Learning Advantages for Promotion of m-Health in Myocardial Infarction”

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**Background:** In ۲۰۲۰, the World Health Organization introduced cardiovascular diseases as the first cause of death. One of the common causes of this category of diseases is Myocardial Infarction. Myocardial Infarction is necrosis of the myocardium caused by an obstruction of the blood supply to the heart. The advancement of hybrid technologies such as machine learning and m-health provides a significant capacity for managing the treatment of this disease.

**Objectives:** In this study, we determine how m-health can benefit from machine learning to manage Myocardial Infarction.

**Materials and Methods:** This study is a rapid review. We applied MeSH Terms such as: Machine Learning, Telemedicine and Myocardial Infarction by Boolean operators in databases including: IEEE Xplore, ISI-web of science, Pub Med, Scopus, Science Direct and Google Scholar in recently five years. The obtained articles synthesized in accordance with the study goal.

**Results:** Our findings showed that m-health used these models of machine learning to manage/monitor Myocardial Infarction: A) statistical learning models

for processing and analyzing clinical data B) data mining algorithms for classifying clinical data and training the databases.

**Conclusion:** The development of applications using machine learning on mobile health platforms warns more efficiently and effectively the prognosis of Myocardial Infarction and since it is accessible at any time and place, it leads to the realization of the goals of health justice in communities.

**Keywords:** Machine Learning, Telemedicine, Myocardial Infarction.



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## “Determination of the Required Contents for Development of Mobile Based Self-care Application for Patients with Chronic Otitis Media”

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**Background:** One of the most promising approaches for managing chronic diseases is self-care. It guides patients to perform preventive activities, increase the quality

of care and increase their satisfaction. Various mobile phone-based applications are used to prevent and manage the disease. These applications optimize the use of limited resources by overcoming geographical and financial barriers and save patients time to reach physicians. Chronic Otitis Media (COM) is characterized by persistent middle ear discharge along with a perforated tympanic membrane for more than three months.

**Objectives:** The aim of the present study was the investigation of requirements for the development of a self-care application for patients with COM.

**Materials and Methods:** In this descriptive study a 10-question semi-structured interview was completed by 10 otolaryngologists at Khalili Hospital affiliated with Shiraz University of Medical Sciences, Iran in 2022. In addition, three professors in the field of health information technology were interviewed.

**Results:** The findings showed that the extracted requirements for developing a self-care application program of COM must include demographic data, records of symptoms and related information with the disease, records of comorbidities, current drug history, educational content, information about common drugs for COM, frequently asked questions (FAQ), and communication between doctor and patient.

**Conclusion:** This study presented the requirements of self-care application for patients with COM in the four areas of demographic data, clinical data, application educational content and application features. These requirements should be considered in the development of the mobile application for self-care of patients with COM.

**Keywords:** otitis media, Self-Care, Mobile Applications.

## “Evaluating the role of Mobile Health in the treatment of Anorexia Nervosa: A Systematic Review”

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**Background:** Anorexia Nervosa (AN) is an eating disorder that is characterized by low weight, food restriction, fear of weight gain, and a strong desire to lose weight. Due to the increasing growth of mobile phone technologies, mobile health has become an efficient tool to improve patients' self-management and their quality of life.

**Objectives:** The purpose of this study was to determine the role of mobile health in the treatment of patients with AN.

**Materials and Methods:** This systematic review was conducted in 2022, based on searching in reliable databases PubMed, Web of Science, Scopus, and Google Scholar search engine and using the keywords Mobile Health, Anorexia Nervosa and Mobile Applications.

**Results:** 13 of the total 90 articles were included in the study. The interventions used in these studies were chat sessions, video conferences, email, recovery vodcasts, mobile applications, educational videos, and family-based therapy. Results showed that the use of mobile health in the treatment of this disorder is cost-effective and leads to relatively high satisfaction in patients. It can also overcome the barriers of treatment based on geographic area and psychosocial treatment and expand access to treatment. Mobile health has a positive role in facilitating long-term commitment due to audio alert and notifications to patients.

**Conclusion:** According to the findings of this study, mobile health is effective in the treatment of anorexia nervosa, and there is essential to apply and use new technologies to organize and provide better services as well as control and manage this disease.

**Keywords:** Mobile Health, Anorexia Nervosa, Telemedicine, Mobile Application

## “Using Google Trends Data to Study Public Interest in Breast Cancer Screening in Iran: Digital Health”

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**Background:** Digital health is introduced as a major aspect of health; its sources are digital data and it uses spaces such as Google, YouTube, and Twitter as databases.

**Objectives:** This study aims to investigate the public pattern in seeking breast cancer screening information in Iran using Google Trends.

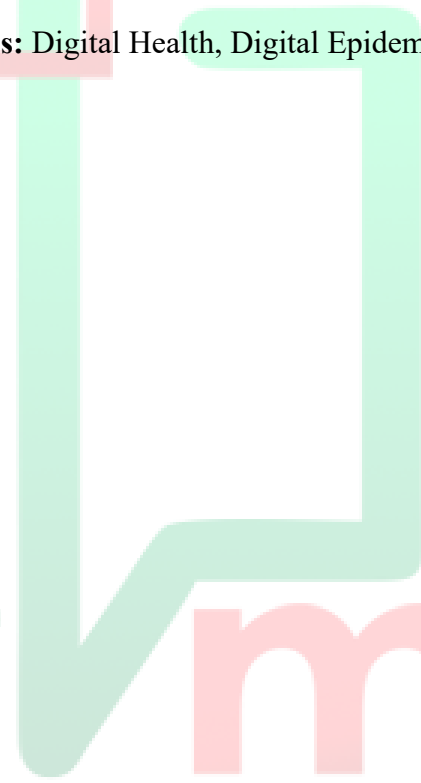
**Materials and Methods:** In this research article the Google Trends database was evaluated for the relative Internet search popularity of breast cancer and screening-related search terms from 2010 to 2022. Google Trends data, providing relative search volume (RSV) data scaled to the highest search proportion per week (RSV100) for search terms over time since 2010 and across different geographical locations. The data for each studied keyword was extracted from Google Trends and classified in Microsoft Excel. The Google Trend index data for each keyword was extracted in a time-dependent graph.

**Results:** We observed an upward trend in the search pattern of both breast cancer and mammography keywords from 2010 to 2018. In these years, the search for breast cancer was more than mammography, but from 2018 onwards, the keyword search for mammography was more. The search trend of both keywords is rising in October. The lowest search percentage is in Sistan Baluchistan and South Khorasan

**Conclusion:** Public interest trend in breast cancer screening is strongly correlated with the breast cancer awareness campaign, Pink October. Google Trends data provides enormous scientific possibilities, but are not a suitable substitute for, but may complement, traditional data collection and analysis about cancer screening and related interests.

**Keywords:** Digital Health, Digital Epidemiology, Google Trends, Breast Cancer

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## “A virtual reality based framework for mobile health user experience evaluation for mental health promotion”

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**Background:** Companion health is a promising approach to promote mental health. Most people use mobile health apps, but some found it easy to use. Mobile health systems interact with users in many ways and are constantly evolving, so user experience (UX) research is necessary. UX designers should think about each person who has a different life experience and identify how people use the product and provide a solution for it.

**Objectives:** The purpose of this study is to design and improve mobile health as an innovative user-centered strategy using virtual reality.

**Materials and Methods:** We used an improved companion health program for the experiment. Experiments are remote and face-to-face using the Figma design tool, and after combining the research with program usage experiences and key insights from the design cycle, a new version of the mobile health plan will be created for development and implementation.

**Results:** This product was evaluated with user-centered tests. Practical analysis is provided to improve human-product interaction. As a result, it provides beneficial, fair use. The results were discussed and a VR-based framework was formulated.

**Conclusion:** This study helps to design a companion health management program to address pain points. People of all ages should be encouraged to use mobile health. Since much of the information involves patient participation, future trials should aim to facilitate greater levels of telehealth.

**Keywords:** user experience, virtual reality, mental health, digital technology, mobile health



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## **“A virtual reality based framework for mobile health user experience evaluation for mental health promotion”**

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**Keywords:** user experience, virtual reality, mental health, digital technology, mobile health



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## “A Taxonomy for Virtual Reality Applications to Manage Infectious Disease Outbreaks”

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**Background:** The rapid spread of infectious diseases is identified as a global concern that has forced all countries to utilize information technology more than ever before in various fields, such as healthcare, education, and business. Virtual Reality (VR) is a computer-generated simulation, which can provide a virtual world with interactive and immersive features for users. The use of VR has the potential to promote public health.

**Objectives:** This study aimed to present a taxonomy for showing the applications of VR in managing infectious disease epidemics.

**Materials and Methods:** The taxonomy is developed in two stages: (1) a literature review to gather VR applications for managing infectious disease epidemics through the search in PubMed, EMBASE, Cochrane Library, IEEE, and Google Scholar, and (2) developing a taxonomy based on the previous phase and validating it through a Delphi method by 14 experts.

**Results:** The proposed taxonomy demonstrates that during various pandemics, such as Ebola, SARS, Influenza, and COVID-19, VR has been used for different purposes, including virtual education and training, helping in diagnosis, data visualization, remote consultation/telecommunication, simulating human behaviors, simulating infection transmission and aiding in drug discovery and

vaccines. These objectives and experts' recommendations were categorized into six main topics: prevention, diagnosis, treatment, follow-up, protection, and entertainment. VR applications have more highlighted in the preparedness and response phases of epidemic management.

**Conclusion:** VR with its various capabilities has played a positive role in the management of infectious disease outbreaks. However, the use of all potentials of this technology should be considered.

**Keywords:** Virtual Reality, Disease Outbreaks, Infections

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## “Designing a mobile application for psychological interventions in a crisis of disease”

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**Background:** Crisis of disease increases anxiety, and intervention is necessary. It has been determined that the use of mobile devices is successful due to the ease of use and regulation of health care.

**Objectives:** psychological intervention systems have been developed for crisis of disease.

**Materials and Methods:** The study is an applied development. Through the review of the literature, the applicability and non-applicability of the software were determined. A comparative review of similar applications in Google Play and App Store was accomplished, and eventually, the final model of the software was developed. The information was collected by the research group. The sleep

questionnaire of Pittsburgh Buys (۱۹۸۹) and the DASS-۲۱ of Lovibond & Lovibond (۱۹۸۳) were used for the initial assessment.

**Results:** The software is designed based on the web. In the beginning, each person is given a code, and each subsequent visit has the ability to follow up with the same code. person is assessed using questionnaires and enters the relevant pages based on the severity of the problem. Also, the content is presented based on the level of introduction as a patient, the patient's family, and the treatment staff. The pages include general and specialized information about the disease, online contact, religious information and education. After completing this part and receiving education, the re-evaluation menu will be activated.

**Conclusion:** This application can provide mental health information and scientific tips for managing mental health and helps with user convenience and reducing the frequency of unnecessary referral to the hospital.

**Keywords:** Applications, Mobile, crisis, designing

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## “Mobil health ecosystem: A systematic review”

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**Back Background:** Mobile health or mhealth is more complex, and challenging and yet important and emerging topics. One of the conceptual frame work that can be effective in identifying and resolving mhealth challenges is ecosystem perspective.

**Objectives:** The purpose of this study is to compare and analyze different perspectives related to the mhealth ecosystems in published research worldwide.

**Materials and Methods:** This research was a systematic review study of articles related to mobile health ecosystem with Meta-Analyses (PRISMA) method and a search strategy: TITLE: ((mhealth) OR (mobile health) OR (m-Health)) AND TITLE: (ecosystem). That was done between 2010-2022 on PubMed, Google Scholar, WOS, and Scopus databases.

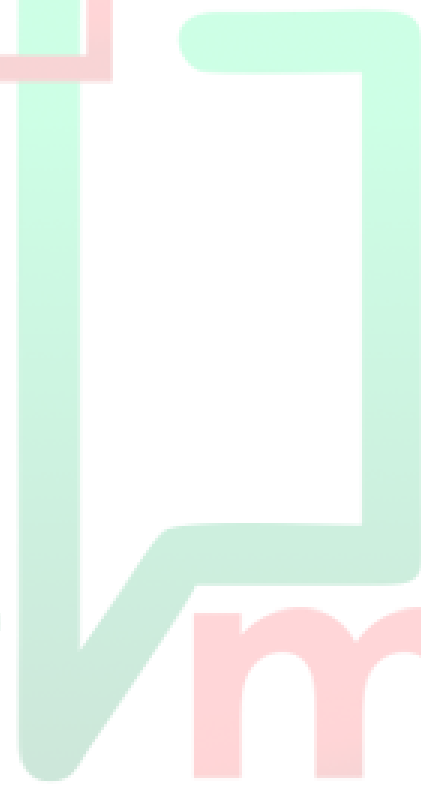
**Results:** Based on literature review, one of the major and most recent issues driving Mobil health ecosystem growth and modification is the ongoing COVID-19 health crisis. Based on the literature review, the main areas related to the mobile health ecosystem include the following: <sup>1</sup>. Application, <sup>2</sup>. Health system (Health care

worker Supply chain Patient) ٣. Technology software and hardware. ٤. finance ٦.  
Regulation, ٧. interoperability.

**Conclusion:** Two completely separate paradigms have been formed in the field of mobile health in the world. The first paradigm is the use of mobile health in the treatment sector. The second paradigm is the general use of mobile phones in the field of health, such as education and entertainment. The ecosystem of these two paradigms is different and requires separate analysis.

**Keywords:** Mobile Health Units, mobile health, m-health, telemedicine, ecosystem

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## “ M-Health: A Scientometric Analysis”

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**Background:** “Mobile Health” has an important role to promote healthy lifestyles and health care quality by improving access to medical and health information.

**Objectives:** This article Aim is to analyze and visualize the structure and the emerging trend of “Mobile Health” topics in the world based on WOS articles.

**Materials and Methods:** A scientometric analysis was undertaken to mining the trends in “Mobile Health”. Data was extracted from WOS database. The search strategy was “m health” (Title) OR “m-health” (Title) OR “mobile health” (Title) OR “mobile-health” (Title) OR “Mhealth” (Title). CiteSpace software undertaken to co-word analysis.

**Results:** Based on search strategy results, ۶۴۳۲ articles retrieved. The network consist of ۱۱ clusters. ۱.mhealthe acceptance ۲.mhealth services ۳.physical activity(sport) ۴.arrhythmia management ۵.mhealth community base ۶.HIV prevention ۷.allergic disease ۸.telemedicine ۹.emergency use ۱۰.infection and ۱۱. tele assessment .

**Conclusion:** Base on this paper More than ۸۰ percent of mhealth articles published ۲۰۱۶-۲۰۲۲. Most important topics was epidemic disease management by mhealth.

Shiraz International mHealth Congress

**SIM Congress**

January ۲۴-۲۶, ۲۰۲۳

Shiraz University of Medical Sciences, Shiraz, Iran

**Keywords:** Cell Phone Use, Mobile Applications, Bibliometric, Telemedicine



## “The use of simulation technologies in disaster management”

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**Background:** Minimizing the impact of disasters is essential in today's society, so education is a top priority to make this happen. Disaster preparedness training requires innovative training methods to be more effective compared to traditional approaches.

**Objectives:** this study was conducted with the aim of reviewing the application of simulation technologies in disaster management in ۲۰۲۳.

**Materials and Methods:** This study was conducted as a systematic review in the period from ۲۰۱۸ to ۲۰۲۲ in PubMed, Google Scholar, Embis and Cochrane databases. Keywords used for the search included simulation, disaster, and technology. The different stages of the search were done by two researchers and the articles were screened in terms of the title, abstract and text of the article, and finally the remaining articles were selected for the final analysis.

**Results:** After searching the databases, 10 articles were extracted, of which 0 articles were related completely to the purpose of the study. Using simulation for training is very effective both in terms of cost and flexibility for various applications, such as creating situational awareness and creating scenarios for training domains. With regard to technical and non-technical skills, simulation-based training plays an important role in emergency surgery. In addition to focusing on skill acquisition, it is also important to ensure that surgeons are able to perform a variety of tasks in unique and challenging situations.

**Conclusion:** Simulation-based training can be a valuable training method in this situation, as it provides opportunities to practice and prepare for high-risk, often low-frequency events.

**Keywords:** Disasters, simulation, technology, management

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## “The effectiveness of using mobile phone applications to improve the quality of Diet in children: A systematic review”

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**Background:** The use of mobile applications to achieve dietary goals has been a growing trend worldwide with the continuous development of mobile technology. The use of mobile applications to achieve dietary goals has been a growing trend among children worldwide with the continuous development of mobile technology. Assessing diet quality through food patterns or food groups compared to recommended dietary guidelines is effective in determining adequate nutrient intake.

**Objectives:** The purpose of this systematic review is to investigate mobile phone applications and their effects on children's diet quality.

**Materials and Methods:** Main databases were searched to retrieve studies from baseline to August 2022 for studies with either dietary quality scoring or individual dietary assessment using mobile phone applications in children.

**Results:** In total, 9 studies were included. Each of the studies had a different criterion for determining the quality of the diet. Studies were either assessed by diet quality scoring or individual dietary assessment. 4 studies showed positive changes of mobile applications in the quality of life of the participants.

**Conclusion:** Mobile phone applications can be a useful way to improve the quality of diet in children, although more studies are needed to investigate the effect of these applications in improving the quality of children's diet.

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Shiraz University of Medical Sciences, Shiraz, Iran

**Keywords:** Diet, Mobile Applications, Telemedicine, Child





## “LIMON (Liver Monitoring): An application for patients with fatty liver”

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**Background:** Fatty liver disease is caused by the accumulation and deposition of fat in liver cells. Currently, 30% of people have this disease. This disease often occurs as a result of many conditions, including alcohol consumption, metabolic diseases, drug use, and nutritional disorders. And it is considered a serious risk factor for other diseases such as cardiovascular and diabetes.

**Objectives:** Since fatty liver disease is one of the silent and symptomless diseases, prevention of it is one of the priorities, therefore, the idea was developed to design the application for the management of fatty liver and its components.

**Materials and Methods:** This is a design idea that includes demographic data and and ,it also contains different fields including drug registration, dosage, recording interpretation, recording daily activities and eating habits, feeding the educational file, loading sonography images, and if the specialists are internal. Your physician is choosing his treatment method (traditional medicine - chemical therapy).

**Results:** With this application, patients can take care of themselves and also manage and control their disease by recording the necessary data. When the liver enzyme is

high or there are symptoms of fatty liver, the patient can choose the treatment method through traditional medicine or medicine and nutritional counseling. And exercise, and if necessary, control his disease by consulting with the relevant doctor.

**Conclusion** Patients can save time and money, benefit from online medical technology and remote consultation, and reduce the number of patients with fatty liver disease with more knowledge Finds.

**Keywords:** Fatty liver treatment, liver problems, medical Android application



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**“Investigating the role of Mobile Health in Parkinson's disease  
self-care education: A systematic review”**

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**Background:** Parkinson is a movement disorder caused by insufficient release of dopamine, which causes slow movements and trembling of the limbs. Mobile Health is a new technology to discover ways to control diseases.

**Objectives:** The aim of the study was to investigate the role of mobile health in Parkinson's disease self-care education.

**Materials and Methods:** This review study was conducted in December 2022 by searching the keywords “Mobile health”, “Self-care” and “Parkinson Disease” in PubMed, Scopus and Web of Science databases and the Google Scholar search engine without time restrictions.

**Results:** A total of 512 articles were searched, and after checking the full text of the articles, 4 articles were included in the study. According to the findings of the studies, in 75% of the articles, the positive and significant impact of mobile health on the process of self-care and control of non-motor symptoms of Parkinson's disease, as well as motor symptoms to prevent the complications of lack of balance control, were mentioned. Also, in 25% of the articles, the increase of preventive psychosocial support for the patient's relatives in the early stages of disease was discussed through mobile health interventions.

**Conclusion:** Mobile health can play a positive role in controlling the disease and mental pressures caused by the burden of the disease by doctors and the patient's relatives, as well as reducing the complications caused by motor and non-motor symptoms via educating self-care to patients with Parkinson's disease.

**Keywords:** Mobile Health, Parkinson Disease, self-care

## “A bibliometric analysis of the trends of scholarly publications in m-health privacy protection”

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**Background:** Users exchange a lot of their own health-related data with one another using health and medical apps. Therefore, protocols must be followed to safeguard user data privacy.

**Objectives:** To analyze relevant literature that might serve as a good foundation for future research.

**Methods:** “privacy policy” OR “privacy regulation” AND “mhealth” OR “mobile apps” were searched within the article title, abstract, and keywords in Scopus with no time limitation. A descriptive summary of the literature was obtained from the Scopus analysis tool.

**Results:** 799 articles in all were retrieved between 2006 and 1/5/2023. The majority of pertinent papers (n=120) were released in 2021. The top journal was JMIR mhealth and uhealth (n=43). The most brilliant author among the top 10 authors in this field was J. Torous (n=13). The University of Oxford was the top institution performing research in this area (n=16). The most prolific country in publishing articles was the US (n=242). Research articles (n=310) made up the majority of publications in terms of the document type.

**Conclusion** The trend of pertinent studies has grown concurrently with the COVID-19 pandemic and the post-pandemic environment. A minimal amount of relevant

publications are published by Iranian authors. The importance of developing privacy protection policies and mechanisms is underscored by the rising trend of developing health-related apps.

**Keywords:** privacy, mhealth, mobile apps



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## “Investigating The Effect of Occupational and Demographic Factors on Self-Care Education in Diabetic Patients Undergoing SMS-Based Education and Comparing It with Group-Based Training and The Control Group”

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**Background:** Education through mobile phones is one of the new solutions for self-care education in diabetics.

**Objectives:** This study aimed to evaluate the factors affecting self-care education in diabetic patients through SMS and compare them with group-based education and a control group.

**Materials and Methods:** In this experimental study, 168 type 2 diabetic patients in three family doctor clinics were randomly divided into three intervention groups. The duration of the intervention was three months. The education consists of 12 one-hour weekly sessions in group education, daily short message in the SMS group and a control group. At baseline and after three months, three groups were examined by the (DSMQ) questionnaire.

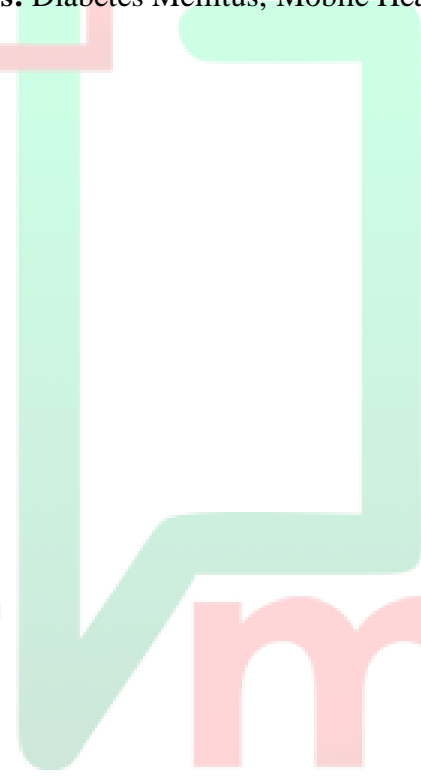
**Results:** Age has a significant negative effect on post-intervention questionnaire score in group training. (P-value: 0.008) It was not statistically significant in the mobile group. In the control group, there was a slight drop in the score of the DSMQ

questionnaire in the housewives (-0.1 score change compared to baseline). But in the SMS-based and group-based education, the score increased significantly (+1.7 and +1.3, respectively), so it was almost equal to other occupational groups. In the SMS group, people with less than a high school diploma showed improvement in the quality of their care, almost equal to higher educational levels (the score change 1.7 versus 1.75).

**Conclusion:** In education by SMS, the quality of self-care in vulnerable subgroups such as older people, housewives, and people with less than a high school diploma had improved almost equal to others.

**Keywords:** Diabetes Mellitus, Mobile Health, Self-Care, patient education

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## “Applications of Intelligent Computer Diagnosis Systems in Different Majors of Medicine”

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**Background and aims:** As artificial intelligence (AI) technics have dramatically grown, a new horizon is appeared in the field of medicine called intelligent medical diagnosis. These diagnosis systems have developed in all majors of medicine like neurology, psychiatry, anesthesiology, epidemiology, pathology, gynecology and obstetrics, radiology, cardiology and genetic. Early detection of some critical diseases, decision making in situations when confronting high number of medical factors, detecting of variations in medical images that cannot be seen by visual inspections, predicting the prevalence of contagious disease, are the examples of intelligent diagnosis systems.

**Materials and Methods:** The known AI methods, which have been used in intelligent medical diagnosis, are statistical inverse problem for localization a lesion, graph theory (e.g., find functional connectivity among different parts of the brain), deep learning (e.g., classification and regression in big data analysis), fuzzy logic (when uncertainty exist in the diagnosis), mapping biomedical signals to the Riemannian space (for better separation), statistical machine learning methods, evolutionary search methods and statistical pattern recognition. These methods are able to learn supervised and unsupervised patterns for classification (e.g., normal from abnormal) and clustering tasks, respectively. To customize a model and optimize its parameters for a specific medical data, evolutionary-based search

methods are used. When the labels of samples are continuous, statistical and neural regression models can be used to determine continuous score of the diseases, which have been previously determined by filling up a questionnaire.

**Results:** Classification of attention deficit hyper activity disorder from bipolar manic depression (BMD) patients by characterizing their electroencephalogram (EEG) signals both in the idle state and in presence of visual stimuli were carried out with 84% and 90% accuracy, respectively. In addition, BMD cases were differentiated from schizophrenic patients by mapping their EEG to the Reimannian space up to 98% accuracy. Localization of focal seizure sources is estimated with high precision in the range of millimeter. Electromyogram signals are repeatedly diagnosed to estimate motor unit action potential shapes and firing rate of motor units. Covid-19 death rate was repeatedly estimated by statistical regression methods. Moreover, computed tomography images of patients with Covid-19 were applied to deep neural networks and the diagnosis precision exceed 98%. Infertility rate were successfully predicted by data mining methods considering efficient factors. Plenty of electrocardiography signals belonged to different heart disease (e.g., ventricular tachycardia and ventricular fibrillation) have been diagnosed and detected. Super-family proteins are quiet high dimensional data and classified by fuzzy networks.

**Conclusion:** Some of intelligent diagnosis systems are commercialized in the fields of cardiology, radiology and neurology. Early diagnosis of some diseases like Alzheimer by these intelligent systems can significantly prolong the patients' life. Nevertheless, some of these diagnosis systems are still spending their infancy period and still could not provide promising results.

**Keywords:** artificial intelligence, medical diagnosis systems, early detection, neurology and psychiatry, rehabilitation.

## Digital technology in Hepatology & Gastroenterology

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### ABSTRACT

Digital technology is an umbrella that covers a wide range of healthcare services, including gastroenterology and hepatology, and its implementation requires a multidisciplinary team. Digital technology has various benefits in gastroenterology and hepatology, including impact on health economics, changes in lifestyle and life expectancy, disease prevention and treatment. The most advances in digital technology in gastrointestinal and liver diseases have occurred in the fields of electronic health records, Mobile Health, and artificial intelligence systems. Electronic health records have improved access to history, laboratory data, imaging, and warnings of medication errors. It is also useful in research. Mobile Health has improved communication between patients and healthcare workers as well as patient education. Artificial intelligence is especially used in fields where images are available such as endoscopy, colonoscopy, endoscopic ultrasound, endoscopic retrograde cholangiopancreatography, capsule endoscopy, and histology. Artificial intelligence reduces intra/interobserver bias. The legal status, privacy of patients, and incentives for doctors and companies in digital technology are still unclear and there is a need to develop new laws in these fields.

**Keywords:** Digital technology, Hepatology, Gastroenterology, mobile Health, Artificial intelligence

## “The Importance of Data Standards for Mobile Health”

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**Background:** Mobile Health (mHealth) technology improve the efficiency of procedures and the quality of health care. One of the main challenges in the development of mHealth technology is the application of data standards. In mHealth care, lack of common data standards has prevented information sharing. Nevertheless, for healthcare practitioners to trust information that comes from mHealth devices and applications.

**Objectives:** Present study aims to express the need of data standards for implementing the mHealth technology and introduces some of the common standards use in health care information systems.

**Materials and Methods:** This review was conducted by searching keywords such as mobile Health, data standards, and Importance in scientific databases and e-Journals.

**Results:** Data is considered the new oil of the 21<sup>st</sup>. The key to success lies in making data accessible and easier to comprehend for various teams, this can be achieved with the help of data standards, allowing data and code to be exchange and reused in different systems. For example, to reach interchange that are based on mHealth data, providers must know that a morbidity from one facility is comparable to a report at another institution. Fortunately, in healthcare there are many standards that have been developed. One example of such a standard is ICD (International Classification of Diseases and related health problems), the Global Standard for Diagnostic Health Information, now almost universally accepted by healthcare organizations for standardizing diagnosis and related health problem information. Technology in mHealth also needs such standards to realize a significant impact on health care. The Key Health care standard coding systems are as follows: ICD-11,

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ICHI, ICF, ICD-O-3, ICD-NA, ICD-DA, ICHD-II, ICSD, ICECI, SNOMED-CT, CPT, ICPC, ICD-10-PCS, LOINC, DSM-IV, UMDNS, ICNP, NIC, NOC, and ... .

**Keywords:** Mobile Health, Data standards, Importance, Health care.



## “Promotion of Mobile Health Information: Policies and Images of Knowledge Production in Iran”

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**Background:** To achieve a developed country it is necessary to transform the system of knowledge production and use of technology in the country. Today, the use of mobile devices has made it possible to create different information easily.

**Objectives:** The purpose of this research was to investigate policies and process production of knowledge in Iran.

**Materials and Methods:** The keywords of policies, science, Iran, knowledge production were searched systematically in Pub Med, Google Scholar, and Scopus databases using PRISMA guideline. The related Persian and English articles were selected from 2014-2022.

**Results:** A total of 25 articles were extracted, and 5 articles were selected. The results showed that, researches are mostly done with government investment and are often supply-oriented and higher education-oriented. The results of knowledge production are not comprehensive and have no continuity. The ability of university researchers to produce knowledge and technology is not consistent with the needs of industry customers. The output of most researches does not have the ability to be converted into necessary achievements, effects and consequences.

**Conclusion:** Knowledge production is not achieved by those carried out in a short and limited time, opportunity-oriented and supply-oriented. For reaching the advanced areas of global knowledge, the production of knowledge in the country should be planned based on chain and connected researches.

**Keywords:** Mobile Health Information, policies, science, knowledge production



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## Healthcare Big data analytics (BDA): tools, techniques, models, and applications

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**Background:** Healthcare globally has shifted from a disease-centered approach to a patient-centered approach. Effective management and healthcare BDA are requirements for this shift in approach.

**Objectives:** This study aimed to identify the common analytical tools, techniques, and models used for healthcare BDA and its applications.

**Materials and Methods:** A literature review was applied using the Scopus, PubMed, Science direct databases, and google scholar search engine over the period 2010–2022 in accordance with the PRISMA statement guideline. The following search terms were used in our search strategy “Big Data” OR “Healthcare Big Data” AND Management OR Process OR Analytic AND Applications OR Uses. Thematic analysis was applied for data extraction.

**Results:** Hadoop and MapReduce are the most common tools, modeling, machine learning, data mining, and visualization approaches are the most common techniques, and Support Vector Machines, Artificial Neural Networks, Random Forest, and Logistic Regression are the most common models for healthcare BDA. Identifying the causes of diseases, predictive analytics to prevent diseases and their outbreaks, monitoring patients' health, selecting treatment alternatives, extracting patterns of diseases, and reducing healthcare costs through the use of clinical



insights in care and especially personalized medicine are applications of BDA in healthcare.

**Conclusion:** The main focus of healthcare BDA should be on using the right tools, techniques, and models at the right time to provide insight into clinical data for clinical decision support, evidence-based medicine, personalized medicine, public health, epidemiological purposes, and effective management of healthcare organizations.

**Keywords:** Big data, Healthcare, Big data analytics.



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## “The Integration of Mobile Health Technologies with Electronic Health Record: Review of key Consideration”

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**Background:** Along with the movement of organizations towards EHR (Electronic Health Record) implementation, the integration of data from mHealth (mobile Health) technologies such as wearable devices and sensors to one or multiple eRecord systems such as EHRs, is increasing. So, one of the important features of mHealth trends is access and integration to EHR.

**Objectives:** Present study aims to review key consideration in the integration of mHealth technologies with EHR.

**Materials and Methods:** This review was conducted by searching keywords such as EHR, Electronic Health Record, mHealth, Mobile Health Technologies, and Integration in scientific databases and e-Journals.

**Results:** The integration produces continuous streams of quality information about individuals' biology, psychology, behavior, and daily environment, which results in reducing health risks and optimizing health outcomes. This scenario helps both patients and the healthcare professionals, and eventually results in better and more personalized care. Despite the advantages of this linkage, there are many challenges related to selecting and integration of mHealth technologies. So, according to the

Model for Assessment of Telemedicine applications (MAST), key considerations for evaluating and selecting devices for EHR integration have been suggested. They include determining purpose, legislation, reimbursement, maturity, health problem, safety, clinical effectiveness, patient perspectives, health equity, transferability, and economical, organizational, sociocultural, ethical, legal, and technological aspects.

**Conclusion:** Despite the existence of many mhealth technologies or devices on the market, they must be tested for data quality, usefulness and interoperability with EHR.

**Keywords:** mHealth technologies, EHR, Integration

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## M-Health Opportunities In the Covid- 19 Pandemic with a Health Information Management Approach

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**Background:** Mobile health, as one of the subcategories of electronic health, can play an effective role in promoting health information management in line with the collection, processing and distribution of health information.

**Objectives:** The present study purpose is to investigate the opportunities of m-health in the covid-19 pandemic with regard to health information management strategies.

**Materials and Methods:** The present study is a simultaneous review of the articles available in scientific databases such as Medline, Scopus, Web of Science, using PubMed and Google Scholar search engines, as well as searching in Google Play and Café Bazar app stores. After applying the inclusion and exit exclusion criteria, a total of 20 articles and 10 Persian applications were extracted

**Results:** : In terms of collecting health information, health applications were the most important tools for diagnosis and follow-up of patients, and contact tracking was the most significant follow-up strategy for patients and suspicious people. M-health based tools were the most important medium for collecting and transferring data to information repositories for analysis and processing. Also, these tools played a significant role in the distribution of information by promoting quick and universal information to the people and the care team. All Persian applications which have been produced during the Corona era, were free and half of them

developed by the Ministry of Health. The adoption of Persian apps was insignificant compared to the penetration rate of mobile phones in Iran, and the results of the correlation analysis showed that there is no significant difference between the quality of the apps and their popularity

**Conclusion:** Due to the high penetration rate of the internet and smart mobile phones, there is a brilliant capacity to use apps in the field of education and health information distribution, monitoring and counseling of patients and suspicious people not only in the field of Covid-19 but also in other fields of health information management.

**Keywords:** Health Information Management, m-health, Application, Covid-19

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