

Mobile Health (mHealth) for Chronic Wound Management: A Review of the Literature

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Aim

Considering the widespread use of mobile phones in healthcare, the aim of this review was to reveal the role of mhealth technology in the management of chronic wounds through self-care or self-management enhancement of the patients and improving access to health care providers.

Methods

We searched PubMed, Scopus, Web of Science and Embase databases for studies reporting the use of mobile phones for managing chronic wounds. The electronic search was conducted in May 2017 and returned 656 records. After removing duplicates and screening at title/abstract level, the full text of 499 papers was examined and 68 studies met the inclusion criteria. We then checked the reference list of retrieved review papers and hand searched the Journal of Medical Internet Research, which identified seven more papers.

Results

We identified 75 papers reporting the use of mobile phones for chronic wounds management. The most common types of the wound under study were lower extremity wound and pressure ulcer with 30 and 20 papers respectively. 45 studies were designed for monitoring and controlling of wounds, 19 for prevention, 7 for detection and diagnosis, 2 for wound treatment and 2 for self-management enhancement by patients. The mobile apps have been developed for both patients and health care providers. Remote wound care, image capturing and transforming, collecting and analysing individual's data, messaging, and alerting have been the main applications for mobile phones. The most dominant technologies used in studies were image-processing algorithms, interface between sensors, mobile Apps and wearable devices.

Conclusion

The use of mobile phone for chronic wound management could help to provide high-quality care, increase the knowledge of the providers, patients and their relatives, facilitate remote wound care, reduce the cost of patient care/patient transportation and decrease rate of infection, amputation and consequently mortality rate.

Key word: Chronic Wound, Mobile phone, mHealth, Mobile health, Smartphone.

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Engineering a Mobile-Based Self-Management System for Tubercular Patients: TBMed Development Study

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Background

TB, a largely curable disease, remains a public health challenge for humanity. One-third of the estimated nine million people who become ill with TB every year is still not accurately diagnosed or effectively treated, and at risk of dying. A major challenge for health systems globally is to develop innovative solutions for control of tuberculosis. This research discusses the development of TBMed, a mobile-based system to improve self-management in tubercular patients and provide a monitoring tool for healthcare providers.

Methods

In order to consider technical aspects and an adequate clinical validation, a structured literature review has been developed. Information retrieved from several databases and systems such as PubMed, Embase, and Elsevier. Through development process and user-centred design approach, key features of the mobile application that fitted the requirements of the end users and environment were obtained. The app was initially tested by both the researchers and the app developers for minor issues and bugs. Through testing, the preliminary acceptability and usability of the system were obtained.

Results

System was developed, including several required features embedded in the mobile app for patient self-management enhancement in one hand and follow up the possibility for healthcare providers on the other. The mobile-based application was developed by the Android Studio framework and PHP, and MySQL technologies were used to prepare the website. A small convenience sample of users was recruited to evaluate the app for functionality and usability. The results showed 77% of the samples were satisfied using this product.

Conclusions

TBMed maximizes health impact by harnessing the opportunities offered by mobile phone technology. According to the results, electronic monitoring of patients empowers healthcare providers to observe patients easier at a lower cost. To control and prevent TB drug resistance, involve TB patients in treatment.

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Artificial Intelligence Applications for Diabetic Patient Distance care: A Review of Literature

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Aim

Considering the widespread use of mobile phones in healthcare, the aim of this review was to reveal the role of artificial intelligence in distance care of diabetic patients.

Methods

We searched PubMed, Scopus, Web of Science and Embase databases for studies reporting the use of artificial intelligence for diabetes distance care. The electronic search was conducted in June 2017 and returned 300 records. After removing duplicates and screening at title/abstract level, the full text of 79 papers was examined and finally 32 studies met the inclusion criteria.

Results

Beside artificial intelligence based technologies for automatic insulin level control (2 papers), machine learning methods have been widely applied to develop mobile based self-management monitoring systems. These systems suggest the proper level of physical activity, nutritional intake, insulin and other required medication management based on collected data through tracking these measures. Collected data were analyzed using intelligent modeling algorithms such as Fuzzy Set Controller (5 paper), decision tree(6 papers), artificial neural networks(7 papers). Also, Agent based Personal Health Systems can personalize for each patient monitoring rules defined in a graphical way (2 papers).

Conclusion

Having collected data of diabetic patients remotely through mobile apps, several vital measures were tracked and patients, data gathered. They were analyzed through intelligent analysis methods and produced a model. Applying these models in the structure of diabetes self-management apps created features such as predicting, estimating, detecting, warning, notification and suggestion for groups of patients to be applied in routine life style improvement. Obviously, using intelligent methods in patient centered models, particularly in distance delivery system, improved the level of care and system performance. Different artificial intelligent approaches, specifically machine learning methods, have potential of providing more and improved personalized care through rules derived from patients, data collected by apps.

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Computer Software and Mobile Apps for Alcohol and Substance Abuse Treatment: A Systematic Review

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Aim

Alcohol and substance abuse is a serious concern and the need of effective treatment is obvious; reaching this point is facilitated by computer and mobile-based software. The aim of the present study was to determine the most common features and characteristics in computer software and mobile apps for alcohol and substance abuse treatment interventions.

Methods

Pubmed, Scopus, Embase and Web of Science were searched using keywords, phrases and MeSH terms in May 2017 and 2327 results were generated and then duplicates removed (n = 1931). Retrieved abstracts were screened and 244 studies found relevant to the current study and finally, 67 studies met the inclusion criteria and were reviewed by two of the authors.

Results

Computer and mobile software used for alcohol and substance abuse treatment were analysed and the most common features were extracted including Education (n = 38), Monitoring (n = 31), Counselling (n = 21), Messaging (n = 20). Alert, Reminder and Security and Privacy with the frequency of 6, 6 and 5 were the next most common features, respectively. Overall, 47 different applications were used for the studies. 30 of them were patient-side and 10 were health provider-side, and 7 were bilateral. 39 applications were used for follow-up and the rest used for behavioural counselling and interview between patients and healthcare providers. Only five applications were designed and developed based on psychological theories.

Conclusion

Ease of use and learning the most common features in any given software are crucial for their acceptability by the users. It reveals that application developers should consider these features in application design. Software which have been used for patient follow up decrease the risk of relapse by improving the decision making process for patients and healthcare providers. Successful treatment needs applications which have been developed based on theories and studies.

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Mobile Applications to Support Depression Self-Management: A Review of Apps

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Background

According to World Health Organization 33% of the years lived with disability (YLD) are attributed to neuropsychiatric disorders. WHO estimated that 350 million people suffer from depression globally. The effect of this burden on society is overwhelming. Meanwhile, Self-management is an important aspect of required care in long-term disorders and diseases management. mHealth based tools such as smartphone applications have been recommended as new tools to support Self-management in depression.

Methods

In this review, we assessed mobile apps focusing on depression in English. The review of mobile apps was developed in the Google play store for Android and then we classified the results to see what is available and what is missing. An evaluation was conducted based on seven functionalities.

Results

Of 251 potentially relevant apps, 68 met our inclusion criteria. However, for self-management assessment 7 applications had the minimum eligibility. The most common functionalities were inform and record. For those with the function to inform, the majority focused on providing information on Depression diagnosis, severity and how to deal with it. Although a number of apps were identified having various functionalities to support depression efforts, some had issues such as incorrect spelling and grammar, inconsistent responses to data entry, problems with crashing, or links to features that had no data.

Conclusions

Given the complex challenges faced by patients with depression, there is a need for further app development targeting their needs. In addition, in development of a multifunctional app, it is required to support the management of depression along with other related mental disorders such as anxiety and stress concurrently.

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