Research Article

The Use of Smartphone Apps for Treatment Management of Substance Abuse: A Narrative Review

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Abstract

Aim: *Smartphone apps can be a valuable tool in substance abuse treatments and supportive services. This study aimed to review the use of smartphone apps in the substance abuse treatment management.*

Method: *Resources were searched on three bibliographic databases, including PubMed, Scopus, and Google scholar, investigated from 2002 through 2022, using key terms, such as smartphone apps, mobile health, substance abuse, drug and alcohol abuse, self-care, and self- management. Selecting articles were based on the PRISMA flow diagram.*

Results: *The results are reported based on the usage of smartphone apps in substance abuse management into nine main categories: supportive counseling, motivational interviewing, educational messages, links to resources, peer group supports, audio-guided relaxation acceptance and commitment therapy, relapse prevention, and self-monitoring.*

Conclusion: *APP can be a useful and feasible tool to assist effective preventive intervention programs, as it was originally developed for such purposes as well. There is great potential for apps to support individuals with substance abuse. However, the efficacy or effectiveness of these apps, or apps in general, is not well understood because the research has yet to catch up to the ever-evolving and expanding mHealth landscape.*

Keywords: Smartphone, Mobile Application, Substance Abuse, Self-Care, Self- Management

1. Introduction

The problematic use of substances such as alcohol, tobacco, and illicit drugs is one of the leading causes of morbidity and mortality worldwide. According to the United Nations report, substance abuse in 2017 caused the death of 585,000 people and caused the loss of 42 million years of healthy life worldwide [1]. The highest prevalence of substance use disorders is in Eastern Europe and the United States, occurring in 5-6% of the population, so out of 1 in 20 suffer from substance dependence Substance abuse has long been recognized as a national problem in Iran that poisoning with pharmaceutical drugs, opioids and alcohols is common [2,3].

According to the statistics of the World Health Organization, 1% of the Iranian population aged 15 or older suffered from alcohol consumption disorders in 2016 [4].

Despite the devastating health and social consequences, a large proportion of individuals who engage in problematic substance use do not seek formal treatment. Help-seeking barriers include concern about anonymity, not knowing about or being able to access treatment, and the financial or time burdens of treatment. Substance abuse often leads to mental disorders that have major consequences for society and require physical therapy, mental

health care, and the use of expensive medications [5-7]. Substance abuse is a common, global and complex phenomenon that causes heavy costs for patients, families and the government. This phenomenon has been increasing day by day among teenagers and young people and has been considered as a continuous concern for society and families. Hence, interventions that can address some of these help-seeking barriers warrant attention to reduce the substantial negative impact of substances at a population level [8-9].

Mobile health (mHealth) interventions intent to solve many of these help-seeking barriers by providing a customer-based approach, improving access and cost-effectiveness [10-12]. mHealth refers to health support delivered on mobile devices, such as cell phones, smartphones, and tablets [11]. In 2019, a search of iTunes and Google Play indicated that up 45,000 smartphone apps are directly accessible. In spite of the potential of apps available to aid people in decreasing alcohol and other drug abuse, only a very small rate of these apps is evidence based [12]. Smartphone technologies provide many opportunities for healthcare professionals to communicate in a real-time situation with patients involved in disease management [13,14]. Research results have indicated that interventions related to smartphone apps can be considered a valuable and helpful tool to promote the patient's self-care through education, monitoring, feedback, and

support programs outside a healthcare setting [15-17]. The use of smartphone apps can be useful in helping of substance abuse patients to motivate and reinforce treatment management and lifestyle modifications to cope with their difficulties [18,19]. This study aimed to review the use of smartphone apps in the substance abuse treatment management.

2. Method

A literature review was conducted on three bibliographic databases, including PubMed, Web of science, and Google scholar, which were investigated from 2002 through 2022. This review was performed using a combination of terms, including smartphone apps, mobile phone, mobile health, substance abuse, drugs misuse, alcohol, addiction. The papers which studied smartphone apps interventions and were in the English language were included in the review. In total, 188 articles were extracted from the three databases. First, 92 articles were removed due to duplication. Then, the titles and abstracts of the articles were evaluated and screened according to the inclusion and exclusion criteria. Finally, 17 articles were included for the final review. Figure1 shows a process of selecting articles according to the Preferred Reporting Items for Systematic Reviews and Meta- Analyses (PRISMA) flow diagram [17-32].
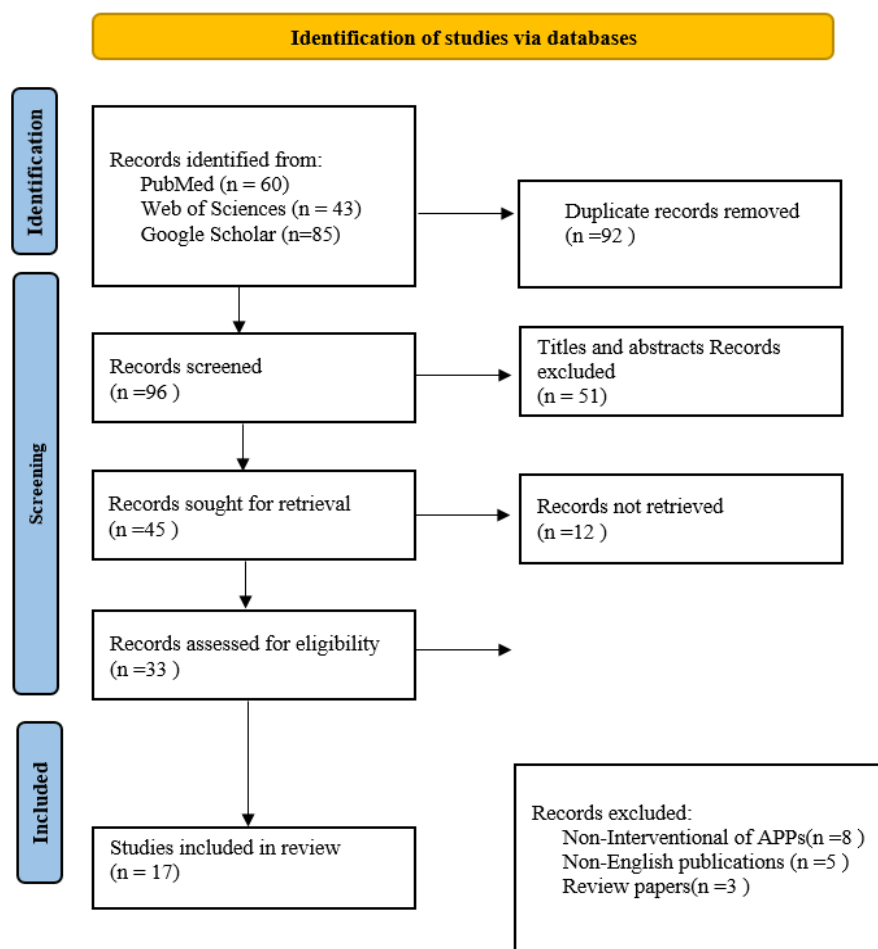

Figure: Flow Diagram of Selecting Studies for the Review

3. Results

The results are reported based on the usage of smartphone apps in substance abuse management into nine main categories.

3.1. Supportive Counseling

Supportive counselling aims to help People with substance use disorders feel deeply understood and supported, and the counselor helps they find ways to resolve issues that might be having [33]. Developing a supportive and trusting therapeutic relationship between the counselor and their client is an important part of the therapy by the Apps. When working with a patient, counselors start with an evaluation to determine whether their condition is classified as substance abuse or addiction [34]. They then use the following techniques to create a positive and supportive environment that helps patients achieve success and makes them more resilient in the face of setbacks: 1- Sense of connection 2- Collaboration 3- Trust [35].

3.2. Motivational Interviewing

Motivational interviewing (MI) is a person-centered strategy. It is used to elicit patient motivation to change a specific negative behavior. MI engages clients, elicits change talk and evokes patient motivation to make positive changes [36]. Unlike clinical interventions and treatment, MI is the technique where the interviewer (clinician) assists the interviewee (patient) in changing a behavior by expressing their acceptance of the interviewee without judgement. Studies have shown that motivational interviewing by APPs is very effective to make positive changes in People with substance use disorder [37].

3.3. Educational Messages

Exposure to substance use prevention messages in school was highest among adolescents aged 14 to 15 (76.4 percent) and lowest among adolescents aged 16 to 17 (67.9 percent) [38]. In 2015, female adolescents were more likely than male adolescents to have been exposed to prevention messages in the past year through media sources, through school sources and to have talked with a parent about the dangers of substance use [39]. Research shows that educational content or educational messages through applications can be very effective in preventing substance abuse in teenagers. Results of the usability items showed that participants might understand questions better and remember their alcohol, tobacco, and drug use status better with in-person interviews, but they still preferred answering these questions on a cellphone [40]. Questions are easy to understand, and they were able to remember their alcohol, tobacco, and drug use status. So, using of educational messages is very necessary in APPs and most of them are using this [41].

3.4. Links to Resources

Links to resources provides addiction, PTSD[Post Traumatic Stress Disorder], lifestyle, and recovery solutions anytime, anywhere, on your phone, tablet, or PC. This 21st Century self-directed interactive Virtual Recovery System maintains a framework of connectivity with the user 24-hours a day [42]. Gonzalez and Dulin in a study named 'Comparison of a smartphone app for alcohol use disorders with an Internet-based intervention' showed that using links to resources resulted in significant decreases in alcohol use. So, by using this links Apps can be very effective in supportive services [43].

3.5. Peer Group Supports

Peer Support Space Online Group is a safe space for anyone to share anything in a nonjudgmental and supportive environment. Peer support is when people use their own experiences to help each other. Earle et al, 2018 showed that by using the social media groups in the management of the treatment of substance use through the transfer of experiences and participation in the discussion is reducing alcohol use [44]. Some App has a Guided Meditation Audio (which guides patient how to treat in abuse situation) with motivational insights, Deep Relaxations and Other Practices. People with substance use disorders they sit back, listen and relax [45].

3.6. Acceptance and Commitment Therapy

Acceptance and commitment therapy (ACT) invite people to open up to unpleasant feelings, learn not to overreact to them, and not avoid situations where they are. Using of this therapy is very common in substance abuse APPs and is highly recommended [46]. Bricker JB et al 2014 resulted that ACT is feasible to deliver by smartphone application and shows higher engagement and promising quit rates compared to an application that follows US Clinical Practice Guidelines [47].

3.7. Relapse Prevention

Relapse Prevention is a skills-based, cognitive-behavioral approach that requires patients and their clinicians to identify situations that place the person at greater risk for relapse – both internal experiences (e.g., positive thoughts related to substance use or negative thoughts related to sobriety that arise [48]. Providers have long recognized that relapse is a process rather than an event. Some relapse prevention programs have delineated stages of relapse, starting with an "emotional relapse" followed by a "mental relapse" and culminating in a "physical relapse." The dissection of the relapse process in this way allows for the early recognition of initial signs and symptoms and the establishment of preventative interventions for each stage [49]. GajeckiM et al 2017 resulted that Skills training apps have potential for reducing excessive alcohol use among university students. [50].

3.8. Self-Monitoring

Self-Monitoring (SM), the act of observing ones' own behavior, has been used in substance use treatment because SM may bring conscious awareness to automatized substance use behaviors [51]. SM's helpful effects are associated with methodological characteristics including longer monitoring and Phone/IVR[Interactive Voice Response] and Computer methodologies compared to Paper/Pencil [52]. The example of self-monitoring component consists of brief (2–5 min) daily interactions with an electronically administered script of questions about substance use, moods, and alcohol-related health behaviors [53]. Patients are asked to access Health Call daily for 60 days, the duration of

treatment. The personalized feedback component consists of 30-day graphs of drinking and other responses based on data from patients' daily Health Call responses, presented to patients and discussed in 10–15-minute meetings with a counselor at 30 and 60 days. Most of the APPs has this option and it helps abuser to track himself. Aharonovich E et al 2017 showed that Health Call and Self-monitoring on the smartphone is a highly feasible intervention in urban, minority individuals with HIV, and suggests efficacy in reducing co-occurring drug and alcohol use [54].

4. Conclusion

To conclude, in studies that we reviewed, APP can be a useful and feasible tool to assist effective preventive intervention programs, and to reduce substance abuse, alcohol use, illicit drugs. It is likely that the beneficial effects of the app such as supportive counseling, motivational interviewing, educational messages, links to resources, peer group supports, acceptance and commitment therapy, relapse prevention, self-monitoring can be maximized when its use is supplemented with personal discussion. In 2020, a study found 50 substance-related mobile phone apps available in the Apple and Android marketplaces focused on alcohol reduction and substance prevention [55].

Further research is needed to assess additional potentials of the app, and it is also necessary to find better ways to motivate the target population to repeatedly use this tool. Similar apps that support personal self-management of chronic health conditions are usually implemented with the involvement of health professionals. School psychologists, health visitors, or social workers can also be involved in such projects to improve the effects of the app as well as to increase the target population's commitment to use it. Preventive effects of the app on substance abuse itself also need to be explored by using probability sampling and larger effect sizes (because our study is just a narrative review) and increasing the heterogeneity (e.g., cross-cultural differences) to find established ways to improve the app so that it can be really called and function as a "prevention" app in the end. Success on such a next step could offer a means to improve the chances of those with Substance abuse to sustain a meaningful and healthy recovery. This narrative study might function as a basis for future research with such purposes.

Authors' Contributions

Primary draft by BB, MJ edited the final manuscript. All authors read and signed the final manuscript.

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