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Article (Monographic)

The use of mHealth Technologies in the Assessment and Treatment of Addictive Behaviors

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ABSTRACT

mHealth technology (i.e., the use of mobile technologies applied to the healthcare domain) has become popular in recent years in the field of psychology. mHealth relies on technological devices such as smartphones, activity trackers, or tablets. Studies in the field of addictive behaviors have shown its feasibility and clinical utility in assessment and treatment. This article describes the most relevant applications of mHealth in the assessment and treatment of addictive behaviors, including computerized tests, ecological momentary assessment and intervention, the use of wearable devices, and interventions assisted by mobile apps. In addition, we describe its potentialities, limitations, and barriers to implementation in the professional practice of psychology. Lastly, examples are provided of some mHealth applications developed by the Addictive Behaviors Group of the University of Oviedo to address tobacco and cannabis use disorders.

Aplicaciones de la Tecnología *mHealth* a la Evaluación y Tratamiento de las Conductas Adictivas

Palabras clave
Conductas Adictivas
Evaluación
Tratamiento
mHealth

RESUMEN

La tecnología *mHealth* (i.e., uso de las tecnologías móviles aplicadas al ámbito de la salud) se ha popularizado en los últimos años en el campo de la psicología. La *mHealth* se apoya en dispositivos tecnológicos como *smartphones*, pulseras de actividad o tablets. Los estudios realizados en el campo de las conductas adictivas han mostrado su factibilidad y utilidad clínica en la evaluación y tratamiento. Este artículo describe las aplicaciones más relevantes de la *mHealth* a la evaluación y tratamiento de las conductas adictivas, entre las que se encuentran los tests informatizados, la evaluación e intervención ecológica momentánea, el uso de dispositivos portables (*wearables*) o las intervenciones asistidas mediante *apps* para móviles. Además, se describen sus potencialidades, limitaciones y barreras a la hora de llevar a cabo su implementación en el ejercicio profesional de la psicología. Por último, se ejemplifican algunas aplicaciones de la *mHealth* desarrolladas por el Grupo de Conductas Adictivas de la Universidad de Oviedo para el abordaje de los trastornos por consumo de tabaco y cannabis.

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mHealth (mobile health) is defined as the use of mobile technologies in the field of health (Cameron et al., 2017; Fatehi et al., 2020), including psychology (Diano et al., 2023; Hall et al., 2021), medicine (Lu et al., 2020), and nursing (Kusyanti et al., 2022). Although the use of technology in healthcare contexts (known as eHealth or digital health) has been implemented since the late 1990s, this field has boomed with the emergence of mobile technologies, which have become very accessible and easy to use, especially in the last decade (Marcolino et al., 2018).

mHealth interventions rely on various devices, including wearables (e.g., activity trackers, digital sensors, smart rings), as well as smartphones and tablets that integrate internet or Bluetooth technology (Cheatham et al., 2018; Fiore et al., 2024; Oesterle et al., 2022). mHealth has been developed as an alternative or complement to traditional face-to-face interventions, which can be hampered by compatibility issues, family or work obligations, the stigma of going to a treatment center, or the inability to travel to the intervention site. Therefore, mHealth-based interventions can be an alternative for specific user profiles who present barriers to attending face-to-face treatment, such as young people (Benarous et al., 2016; Carreiro et al., 2018), pregnant or postpartum women (Silang et al., 2021; Wouldes et al., 2021), or people with mobility problems (Lu et al., 2020). In general, these types of interventions are well accepted by people with addiction problems (Carreiro, Newcomb, et al., 2020; Xu et al., 2021).

This paper reviews mHealth applications in the assessment and treatment of addictive behaviors. Its characteristics, fields of application, advantages, limitations, and barriers to implementation in clinical contexts are reviewed. The text concludes with an exemplification of the implementation of mHealth in the assessment and treatment of three specific behaviors: tobacco use, cannabis use, and physical activity.

mHealth in the Assessment of Addictive Behaviors

Currently, there are at least three mHealth developments applied to the assessment of addictive behaviors from which practitioners can benefit: the use of computerized tests, ecological momentary assessment (EMA), and wearable devices.

Use of Computerized Tests

The use of computerized tests offers a number of advantages to professionals and users (Elosua et al., 2023) that have been further enhanced with the emergence of portable devices (smartphones or tablets). The administration of tests in digital format makes it possible to automate some of the processes, such as correcting the test or the storage and subsequent processing of data, with the consequent saving of time and effort (Elosua, 2020). In addition, these tests allow the presentation of the assessment system to be customized according to the profile of the user completing them, which streamlines the administration of assessment batteries while simplifying the instructions provided to the user. An example applied to the field of addictive behaviors would be the administration of questionnaires relating to the severity of consumption of a given substance only if the person consumes that substance. Shortening and simplifying the assessments reduces the cognitive load (fatigue or difficulties in the response process), improving the reliability and validity of these measures. This is especially relevant when the people assessed present cognitive deficits, which is relatively frequent in the field of intervention in addictive behaviors (Ramey & Regier, 2019). Evidence shows that the application of computerized tests in the assessment of substance use is reliable and valid (Martínez-Loredo et al., 2021). Currently tests can be administered remotely using apps designed for this purpose (Redcap, Kobotoolbox, Google forms, SurveyMonkey, etc.), either on the user's own mobile device (by downloading an app or through a link) or with devices provided by the evaluators.

Computerized adaptive tests (CATs) enable assessments to be carried out digitally (Butler et al., 2017; Liu et al., 2023). Unlike conventional tests, in which test takers respond to a fixed set of pre-determined items, CATs select items optimally for each individual, based on the competence or level in the variable that the test taker manifests throughout the test, with the aim of estimating a score as accurately as possible. The main advantage offered by CATs is the fact that they achieve high accuracy with a smaller number of items compared to conventional tests (Peña-Suárez et al., 2016; Rebollo et al., 2010).

Ecological Momentary Assessment (EMA)

EMA constitutes a methodology that captures behavioral data in the natural context of individuals in real time and on multiple occasions over a period of time (Shiffman et al., 2008), which is consistent with the dynamic and contextual nature of addictive behaviors (Shiffman, 2009). In addition, EMA overcomes the usual limitations of paper-and-pencil recording methods, such as forgetfulness, recall biases, or social desirability (Martínez-Loredo et al., 2017; Steinhoff et al., 2023).

In the assessment of addictive behaviors, the EMA enables a reliable and valid measurement of public and private behaviors in the precise context in which they occur (e.g., craving, consumption episodes, withdrawal symptoms, sleep, mood fluctuations, etc.). These variables are usually assessed by paper-and-pencil self-report questionnaires, which include a reference to the present moment or to recent days or weeks. The possibility of including brief tests administered in the context in which the behavior occurs increases the validity and precision of the measures (Fonseca-Pedrero et al., 2022). Another advantage of the EMA is the possibility of scheduling the completion of the self-report according to certain criteria (e.g., at certain times or at regular intervals), so that a more accurate and representative sampling of the target behavior of interest can be obtained. In addition, the possibility of sending notifications or messages to indicate to the user that it is time to complete an assessment may contribute to greater adherence to assessment and treatment (Bonet et al., 2017).

Additionally, the combination of CATs and EMA can result in accurate and brief assessments. This is very important when performing the assessment in a natural context, since the individual has limited time to answer the items asked. There are currently projects such as the "NIH toolbox", which offer validated CATs. These tests allow emotional, cognitive, and motor variables to be evaluated in one or two minutes in both English and Spanish. Currently they can only be implemented using devices that work with iOS, but this is likely to change in the future, given the feasibility and usefulness of this proposal. It seems, therefore, that

only technological barriers currently separate experimental research from its widespread application in clinical practice. All information about this project can be found at https://nihtoolbox.org/).

Another example of the application of EMA in the assessment of addictive behaviors is experience sampling method (ESM). ESM is a methodology analogous to EMA, as they share many similarities. It allows us to obtain relevant information for the treatment process by collecting the experience experienced by the person in a detailed and natural way (Myin-Germeys et al., 2009), including phenomena such as craving and emotional states, where each person has a different subjective experience depending on the time and context (Leenaerts et al., 2025; Myin-Germeys et al., 2018). To this end the user can record on their own device a narrative of the situation (e.g., substance use, relapse, etc.), a short audio or video. To be representative, the ESM should be programmed following the same parameters that underlie the planning of behavioral observation processes, as this is the only way to obtain representative information on the behavior(s) of interest. The literature indicates the feasibility of using ESM in diverse populations such as people with psychotic disorders (Bell et al., 2017), anxiety disorder (Hall et al., 2021), addictive behaviors (Bertz et al., 2018; Goldfine et al., 2020; Shiffman, 2009), or the general population (Von Haaren et al., 2013).

Wearable Devices

Wearables comprise a set of devices that a person wears on their body that allow measurement of some aspect related to movement (thanks to GPS or accelerometers) as well as various psychophysiological variables (thanks to biometric sensors). It is also possible to assess the level of physical activity (e.g., heart rate, blood oxygen saturation level), sleep (e.g., sleep-wake state, sleep phases), and stress level (e.g., body temperature, level of activation of the autonomic nervous system) (Chu et al., 2017; Düking et al., 2020). There is great variety among these devices and they range from wristbands and rings to bracelets and smart glasses (Carreiro, Chintha et al., 2020; Ferguson et al., 2022; Ravizza et al., 2019). However, the most widespread devices are activity wristbands (usually referred to as activity trackers or fitness trackers in the scientific literature) (Shei et al., 2022).

Although it is difficult to categorize the different types of wearables, a common distinction in the scientific literature is between research/professional wearables on the one hand and commercial wearables on the other (Walker et al., 2016). The former were developed to measure objective physiological variables, such as a person's heart rate, skin temperature, or movement. They are usually equipped with high-precision instruments (Mora-Gonzalez et al., 2022) and their main purpose applied to addictive behaviors is the detection of substance use, craving, or moments of stress through the change in body temperature or heart rate (Carreiro, Chintha et al., 2020; Oesterle et al., 2022). These devices are more expensive, are not available to the general population, and their design is not user-friendly, as neither aesthetic nor usability aspects are considered.

Commercially available devices also measure objective physiological variables reliably, but using less complex instruments (Scott et al., 2019). These devices are available in stores for the general population at affordable prices and their design is user-friendly (they are aesthetically appealing and usable). In the case of commercialized activity trackers, whose popularity has increased significantly, they have an associated app in which data can be dumped and detailed reports of variables related to the level of physical activity, sleep quality, or stress level can be obtained, all variables of interest in the field of addictive behaviors. In addition, these trackers offer other functions, such as a clock, calendar, music player, and many more functionalities that are attractive and useful for the user.

The design and advantages offered by commercial wearables have attracted the attention of researchers and practitioners, as they are reliable (Feehan et al., 2018; Fuller et al., 2020) and acceptable to the user (Creaser et al., 2021). Meta-analyses and reviews of reviews indicate that commercial activity trackers are effective in increasing physical activity (Brickwood et al., 2019), losing weight (Ferguson et al., 2022), and improving negative emotional states (Blount et al., 2021) in diverse settings and populations, especially in combination with other behavioral interventions (Naslund et al., 2016; Oliveira et al., 2020). However, research on the effectiveness of wearables in the field of addictive behaviors is not as abundant as in other fields. There is recent preliminary evidence regarding their feasibility and effectiveness in reducing substance use in people receiving treatment, while promoting physical activity and reducing levels of anxiety, depression, and negative affect (Cuesta-López et al., 2024). These results are promising, but more randomized clinical trials with long-term follow-ups are needed to evaluate the usefulness and efficacy of activity trackers in the treatment of addictive behaviors.

mHealth in the Treatment of Addictive Behaviors

Although new advances related to mHealth are expected to emerge in the coming years, there are currently two developments relevant to the treatment of addictive behaviors: ecological momentary interventions and mobile app-based interventions.

Ecological Momentary Interventions (EMI)

EMIs are treatments delivered in natural settings in the course of a clinical intervention (Bell et al., 2017). Using the data obtained in EMIs to pose an "ad momentum" intervention in the person's natural context is a novel perspective. Reviews conducted so far show that this methodology is feasible and effective in interventions conducted in various populations, such as, for example, people with anxiety disorders, eating disorders, diabetes, or overweight (Heron & Smyth, 2010). Likewise, there have been several clinical trials employing EMI in the field of addictive behaviors. A classic example is the study by Rodgers et al. (2005) aimed at smoking cessation, which compared an experimental group that was regularly sent personalized text messages via cell phone with a control group that only received a message every two weeks with only the contact details of the center in charge of the study. Abstinence rates were higher in the group that received the EMI six months after the end of the intervention. Recent evidence shows that the use of EMI is feasible and acceptable as a complementary intervention to usual smoking cessation treatment (Businelle et al., 2016). In the field of gambling, the implementation of EMI through a mobile app to address the urge to gamble also obtained

satisfactory results in terms of effectiveness (Hawker et al., 2021). Specifically, reductions of more than 70% in gambling episodes were obtained, as well as a decrease in craving levels up to 10.5%. The positive effects of the intervention also occurred in the long term, with an increase in perceived self-efficacy against craving one month after the end of the intervention. Similarly, the combined use of EMA and EMI yields positive results in more recent studies. For example, the clinical trial by Scott et al. (2020) found higher abstinence rates at six months post-intervention in the group that received EMA+EMI compared to the other three control groups that received an intervention based only on EMA, EMI, or a passive control. Another similar study by Hébert et al. (2018) addressed smoking relapse by combining EMA+EMI. In this study, messages were sent to participants based on variables associated with an increased likelihood of having a relapse (e.g., stress level, craving, etc.). The results showed that messages designed to address these risk factors in real time, at the moment they were experienced, were useful in attenuating them and decreasing the risk of relapse. In sum, preliminary evidence situates EMI as a valid option to enhance face-to-face treatments, especially if used in combination with EMA.

Interventions Based on Mobile Apps

In recent years, mental health-related apps have been gaining popularity (Wasil et al., 2022). However, most of them lack empirical support, as hardly any evaluation studies have been conducted (Baumel et al., 2020). This phenomenon is not foreign to the field of addictive behaviors. However, in recent years, apps have been developed to reduce or quit substance use with empirical support of their efficacy (Bahadoor et al., 2021; Boumparis et al., 2019; García-Pazo et al., 2021). Furthermore, the fact that preliminary studies indicate that people receiving treatment for SUD find the use of apps acceptable and even motivating (Fleddermann et al., 2023) points to the need to design studies that evaluate the potential impact of this technology as an adjuvant to traditional interventions.

In the setting of SUD, the systematic review by Bahadoor et al. (2021) analyzed 20 apps, of which 11 focused on alcohol use, six on tobacco use, one on alcohol and tobacco, one on illicit substances, and one on illicit substances and alcohol. Adherence rates to the intervention exceeded 80% at the end of treatment in most studies. Results regarding their effectiveness indicated that only six of the apps achieved a significant reduction over the control comparison, with small to moderate effect sizes. Most of them achieved a reduction in substance use, but the results did not reach statistical significance. Although, overall, the apps did not perform better than the control groups, it is worth noting that the control conditions were mostly active controls, including face-to-face interventions, simplified versions of the apps, self-help guides, or treatment of choice. In any case, it seems clear that studies with long-term follow-ups and quality-assured designs are required in order to obtain more robust conclusions (Bahadoor et al., 2021).

In Spain, the study by López-Durán et al. (2024) evaluated the efficacy of a cognitive-behavioral treatment combined with the use of an app for smoking cessation. Participants were assigned either to cognitive-behavioral therapy (CBT) in videoconference format combined with a "control" app (i.e., with the materials used in the sessions) or to this intervention combined with an app ("Sin Humo") containing the active components used in the treatment (self-reporting of cigarettes, performance of behavioral activation activities, intersession notifications reinforcing goal attainment, and motivational notifications). The abstinence rates at 12 months were 37.1% in the CBT + "Sin Humo" [Smoke-free] app group and 42.6% in the CBT + control app group. Although the differences in abstinence rates were not statistically significant, both the videoconference treatments and the use of apps for smoking cessation were shown to be very accessible interventions with guaranteed effectiveness.

Other apps have been designed to support face-to-face interventions. Examples include apps to promote behavioral activation (Paquette et al., 2021) or the performance of mindfulness practices (Davis et al., 2023; Roos et al., 2024) in people receiving treatment for SUD. Furthermore, the use of apps can increase adherence to medication for treating addictive behaviors (Steinkamp et al., 2019) and contribute to the development of emotional regulation skills in individuals with substance use disorders (Pennou et al., 2023).

In sum, at least to date, it does not appear that the efficacy or effectiveness of apps is comparable to that of face-to-face intervention (Baumel et al., 2020; Kazemi et al., 2021), especially in the long term (Fang et al., 2023). However, one of the potential advantages that this type of approach can offer is its cost-benefit balance (Hicks et al., 2023). In this regard, it should be borne in mind that the cost of face-to-face interventions, in terms of material and human resources, is proportional to the volume of people treated. On the other hand, in the case of apps, once developed, the return on the initial investment is proportional to the volume of users. Maintaining an app in online stores and an open server is low cost relative to the potential profitability of the intervention effect when applied to a large number of people. In short, mobile apps can be seen as a massive and cost-effective form of intervention to address addiction-related problems or as a complement to face-to-face interventions.

Barriers and Limitations of mHealth

Despite the development and potential application of mHealth in the field of addictive behaviors and mental health in general, there are certain limitations and barriers that are particularly relevant in the professional practice of psychology. In particular, these include problems related to privacy, the need for supervision, accessibility for professionals and users, and the lack of scientific evidence for some mHealth tools.

Most of the uses of mHealth involve the use of mobile apps that require users to register or create an account with a service. In certain cases (e.g., apps to perform computerized assessments) it is the practitioner (or treatment center) who creates an account to use the app and no registration is required from the user. On the other hand, in the case of treatment apps or the use of activity trackers, user registration with an email address is typically required. In any of these ways, the data is usually stored in "the cloud", so it is important to rely on verified apps that have security requirements, both for storage and for access to the account created (Agencia Española de Protección de Datos [Spanish Data Protection Agency], 2025; Comisión Europea [European Commission], 2025). Even

when complying with current regulations regarding the protection of personal data (i.e., Organic Law 7/2021, of May 26, on Personal Data Protection and Guarantee of Digital Rights [Ley Orgánica 7/2021, de 26 de mayo, de Protección de Datos Personales y garantía de los derechos digitales]), the data that psychologists handle are always sensitive and their handling has very important deontological and legal implications (Consejo General de la Psicología de España [General Council of the Spanish Psychological Association], 2015). In addition, in the case of interventions in group format, which are very common in the field of addictive behaviors, it is essential to ensure that privacy is respected within the group, if there may be access to other people's digital data through communities or forums. It is also necessary to be aware of the privacy conditions so that the user's anonymity can be protected as much as possible with respect to issues such as data sharing (Hammack-Aviran et al., 2020) or the receipt of notifications that may be intrusive (Hicks et al., 2023).

The flexibility in decision-making required to address addictive behaviors remains, for now, exclusively human. mHealth-based interventions typically have fully predetermined content or offer predefined options before starting the intervention (as is the case with treatment apps), and they usually focus on addressing a specific problem (e.g., quitting smoking tobacco or cannabis, or reducing alcohol consumption) (Albertella et al., 2019; Boumparis et al., 2019; Colonna & Alvarez, 2022; Monney et al., 2015). However, during the therapeutic process, demands or needs may arise on the part of users for which an app or mHealth intervention may not be prepared (e.g., addressing suicidal ideation in a user). For this reason, the use of mHealth technology should always be supervised by adequately trained professionals. Apps should include a way of contacting the professionals in charge (e.g., email or telephone) so that, in case of need, individuals receiving treatment can receive an intervention that is better tailored to their specific case.

Although today, most people with addiction problems have a smartphone (Hsu et al., 2022), there are people who do not. This may be the case of people who present addictive behaviors with a highly impaired profile (i.e., individuals experiencing homelessness, those with a long history of consumption, or those who have failed to quit the addictive behavior in various healthcare settings) (Xu et al., 2021). For these people, it is necessary to have analogical alternatives to carry out interventions with the same guarantees. Another problem related to the accessibility of mHealth is the need to have an Internet connection, in some cases constantly available, and in others at specific times (e.g., to download the app, to configure and synchronize a wearable device, to access an evaluation questionnaire, etc.) in order to use the technology. The practitioner must have viable alternatives in case such a connection is not available.

Evidence-based practice requires quality research that accredits the good performance and appropriateness of the interventions (Gopichandran et al., 2023). Currently, there are requirements to be able to offer apps with health-related content (Google, 2025a) in the app stores (i.e., Google Play, App Store) (Google, 2025b) (Apple, 2025), but these requirements do not include having scientific evidence that the app fulfills the purpose for which it is designed. In fact, most of the apps that can be downloaded freely from stores lack empirical evidence of efficacy (Baumel et al., 2020). It is for this reason that it is essential to distinguish between evidence-based treatments in app format whose efficacy has been evaluated (Heffner et al., 2024; López-Durán et al., 2024) and apps that present mental health-related content that, however useful they may be for the user, are not evidence-based (Baumel et al., 2020).

Examples of the use of mHealth Technology in the Field of Addictive Behaviors

Cognitive-Behavioral Therapy Combined With the use of Activity Trackers for Smoking Cessation and Increased Physical Activity

Currently, the Addictive Behaviors Group (GCA, in Spanish) at the University of Oviedo is conducting a randomized clinical trial (clinicaltrials.gov ID NCT06629467) examining the efficacy of CBT, combined or not with the use of activity trackers, to help participants quit smoking and increase their physical activity levels. In both groups, weekly physical activity goals are set to encourage participation. The research aims to assess the feasibility of using the activity trackers in a clinical setting and to explore their effect on increasing physical activity compared to weekly goal setting in isolation. One of the advantages of using activity trackers is the ability to set personalized goals and accurately monitor adherence, both by users and therapists. Another novel aspect is the use of an objective method for evaluating physical activity, which will allow for examination of the mediating role of physical activity in the smoking cessation process.

CanQuit: An app to Reduce and/or Quit Cannabis use

In October 2024, the GCA of the University of Oviedo published in Google Play (Android) (https://play.google.com/store/apps/details?id=com.canquitapp.app&pcampaignid=web_share) and, recently, also in App Store (iOS) (https://apps.apple.com/es/app/canquit/id6741674707) a free app, called CanQuit, designed to help young adults (18-30 years old) to reduce or quit cannabis use. CanQuit contains a digitized psychological (cognitive-behavioral) treatment with a duration of four weeks. In order to download and use this app, individuals only need access to a mobile device and to be over 18 years of age. CanQuit can also be useful for people who are currently undergoing psychological or substance use treatment, as it can serve as a support to reinforce the skills acquired during the face-to-face intervention.

Within the app, the person undergoes an initial assessment and is then randomly assigned to one of two intervention conditions: 1) a less intensive intervention (self-help guide) or 2) a more intensive intervention (virtual therapist-assisted app). Table 1 summarizes the contents of both intervention conditions.

The self-help guide (in the same way as the virtual therapist-assisted app) is intended to be used for a period of four weeks during which the user must gradually reduce their cannabis consumption on a weekly basis. Within this condition, the user can access the content of the guide as many times as required and use it as preferred. Figure 1 shows the initial screen of the self-help guide.

For their part, individuals receiving the therapist-assisted intervention access the app interface (see Figure 2). Each week they must complete a total of approximately six or seven tasks. This

Table 1
Components of the app Assisted by the Virtual Therapist and the Self-Help Guide

App assisted by the virtual therapist		Self-help guide	
Moment	**Content (tasks)**	**Moment**	**Content (tasks)**
Initial evaluation	• Prevalence, frequency and amount of consumption of legal and illegal substances • Severity of cannabis addiction (CUDIT-R) • Emotional disturbance (BSI-18)	*Initial evaluation*	• Prevalence, frequency and amount of consumption of legal and illegal substances • Severity of cannabis addiction (CUDIT-R) • Emotional disturbance (BSI-18)
Week 1. Get motivated	• Self-monitoring • Psychoeducation (myths, withdrawal symptoms) • Reasons to quit smoking	*Week 1*	Psychoeducation
Week 2. Know your consumption	• Self-monitoring • Psychoeducation (myths) • Consumption triggers • Stimulus control (strategies to avoid smoking)	*Week 2*	Psychoeducation
Week 3. Smoking cessation guide	• Self-monitoring • Psychoeducation (benefits of quitting smoking) • Behavioral activation (task programming) • Relaxation techniques (diaphragmatic breathing) • Training in communication skills (assertiveness) and problem solving • Stimulus control (strategies to avoid smoking)	*Week 3*	Psychoeducation
Week 4. Preventing relapses	• Self-monitoring • High risk situations for substance use (HRS) • Lapse vs. relapse • Relapse prevention plan	*Week 4*	Strategies to avoid smoking
Post-evaluation	Same content as the initial evaluation	*Post-evaluation*	Same content as the initial evaluation
Follow-ups at 3 and 6 months	Same content as the initial evaluation	*Follow-ups at 3 and 6 months*	Same content as the initial evaluation

Note: CUDIT-R = Cannabis Use Disorder Identification Test-Revised; BSI-18 = Brief Symptom Inventory-18

condition also has a number of additional features that have proven effective in other apps aimed at reducing the use of various substances. Specifically, the app includes a group chat (wall) in which each user can anonymously post comments, doubts, concerns, or personal experiences (only the chosen avatar is visible) for the rest of the users to see. In the chat, users cannot interact with each other (only the therapist can manage and respond to messages), and the content of the messages is supervised by the members of the research group. Additionally, users in this condition have the option to keep a daily log of their cannabis and tobacco consumption that is reflected in a personalized consumption graph, which allows the user to monitor their progress throughout the treatment. The therapist is a vital element in the intensive intervention; they accompany the user throughout the treatment and are responsible for explaining the tasks, reinforcing the user's progress, and providing weekly guidelines for reducing cannabis consumption. The gradual reduction of cannabis consumption is achieved by reducing the number of situations in which the user smokes. Thus, a guideline might be as follows: "This week you should avoid using in the following situations: alone at home and in the park." Another noteworthy feature of this condition is the use of contingency management (CM) through a monthly incentive system. CM aims to reinforce app use and maintenance of abstinence. Each time the user completes a task, they receive a series of points; (as they progress through the app, the points obtained for each completed task increase). These points are cumulative, so at the end of each month, the user participates in a drawing for gift cards of various monetary values. In this way, the more points the user has earned by completing tasks, the greater the probability of winning the incentive.

Conclusions

It is expected that the use of mHealth in the field of clinical psychology will increase significantly in the coming years. Currently, there are numerous applications in the field of health, including for the assessment and treatment of addictive behaviors. Developments such as EMA, computerized tests, or wearables allow more accurate, objective, and valid measurement of key variables to understand the processes involved in addictive behaviors. mHealth technology allows ambulatory assessment of individual mechanisms of behavioral change in almost real time, from an idiographic approach, more typical of the contextual-molar approach described in the first and fourth articles in this monograph.

In terms of intervention, the use of EMIs and apps is a feasible, effective, and cost-effective way to manage problems related to substance use and behavioral addictions. However, most available apps lack empirical evidence of efficacy. Despite the limitations and difficulties involved in the implementation of mHealth in the field of mental health—particularly those related to privacy and accessibility—the possibilities offered by this technology can be highly beneficial for advancing the assessment and treatment of addictive behaviors.

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Figure 1
Initial Screen of the Self-Help Guide

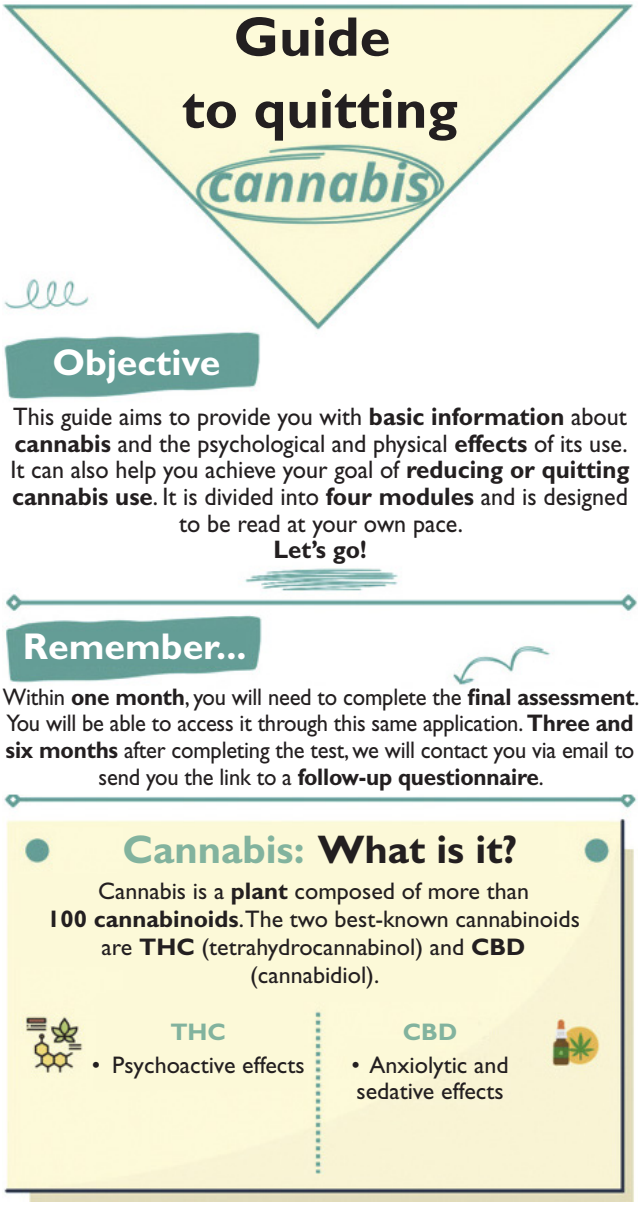
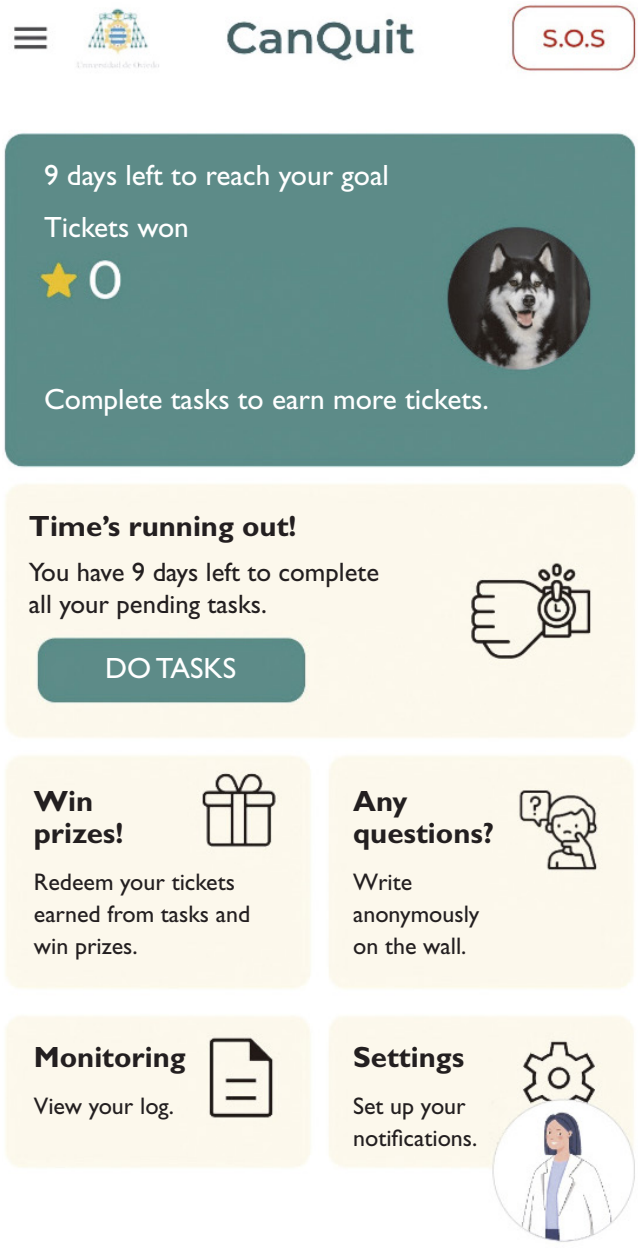


Figure 2
Virtual Therapist-Assisted app Interface



Conflict of Interest

The authors have no conflicts of interest.

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