Technology-Based EMIs for Alcohol Use Disorder: Challenges and Opportunities in the Mexican Context

Leonardo J. Gutierrez

Department of Computing and Design, Sonora Institute of Technology, leonardo.gutierrez@potros.itson.edu.mx

Luis A. Castro

Department of Computing and Design, Sonora Institute of Technology, luis.castro@acm.org

Oresti Banos

Research Centre for Communication Technologies (CITIC-UGR), University of Granada, oresti@ugr.es

The excessive and problematic consumption of alcohol characterizes Alcohol Use Disorder (AUD). In Mexico, the 12-month prevalence of any substance is 2.5%, and the lifetime prevalence of alcohol dependence is 5.9%. Ecological Momentary Interventions (EMIs) are treatments that are provided to patients during their daily lives and in natural settings. EMIs can monitor alcohol consumption, provide personalized feedback, and deliver coping strategies to help individuals manage their cravings and avoid relapse. This work discusses challenges and opportunities associated with technology-based Ecological Momentary Interventions (EMIs) for Alcohol Use Disorder (AUD) in Mexico. We aim to contribute valuable insights into improving AUD interventions and strategies for the Mexican population, which could also provide insights into LATAM countries with similar contexts.

CCS CONCEPTS • Human-centered computing ~Ubiquitous and mobile computing ~Ubiquitous and mobile computing theory, concepts and paradigms ~Mobile computing • Applied computing ~Life and medical sciences ~Health care information systems

Additional Keywords and Phrases: Ecological Momentary Intervention (EMI); Alcohol Use Disorder (AUD); Technologies

ACM Reference Format:

First Author's Name, Initials, and Last Name, Second Author's Name, Initials, and Last Name, and Third Author's Name, Initials, and Last Name. 2018. The Title of the Paper: ACM Conference Proceedings Manuscript Submission Template: This is the subtitle of the paper, this document both explains and embodies the submission format for authors using Word. In Woodstock '18: ACM Symposium on Neural Gaze Detection, June 03–05, 2018, Woodstock, NY. ACM, New York, NY, USA, 10 pages. NOTE: This block will be automatically generated when manuscripts are processed after acceptance.

1 Introduction

Alcohol Use Disorder (AUD) is a condition characterized by the excessive and problematic consumption of alcohol. Interventions for AUD can be essential to help individuals reduce or stop their alcohol consumption and prevent the negative consequences associated with AUD. Ecological Momentary Interventions (EMIs) are technology-based interventions that can be delivered through smartphones and provide real-time support when needed. EMIs effectively improve health behaviors and psychological and physical symptoms [9]. EMIs can monitor alcohol consumption, provide personalized feedback, and deliver coping strategies to help individuals manage their cravings and avoid relapse [10].

EMIs are a promising intervention for AUD [10,15,16,17,18], as they can be delivered remotely, are cost-effective, and can be tailored to the individual's needs and preferences.

Even though studies on alcohol consumption in highly industrialized nations can provide insights into the alcohol consumption patterns of youth, the Mexican context is different in many ways. Therefore, a better understanding of the factors contributing to alcohol consumption among Mexican youth may be essential to develop effective interventions tailored to this population's needs. While research on technological interventions in these topics may be abundant in other regions, research in Mexico or other LATAM countries is scarce.

This work discusses the challenges and opportunities in Mexico associated with technology-based Ecological Momentary Interventions (EMIs) for Alcohol Use Disorder (AUD). The objectives encompass various aspects, including identifying existing implementation challenges, such as cultural, societal, and gender-specific barriers and obstacles related to adopting technology-based EMIs, including the digital divide stemming from language, literacy, and socioeconomic disparities. Furthermore, the objectives aim to explore the advantages and opportunities of technology-based EMIs within the Mexican context. By focusing on the unique challenges and opportunities in Mexico, this study seeks to contribute valuable insights into improving AUD interventions and strategies for the Mexican population, which could also provide insights into LATAM countries with similar contexts.

2 EMIS in AUD

EMIs are a type of intervention that delivers support in real-time when it is most needed and in the context of the individual's daily life [10]. EMIs are delivered through mobile devices, such as smartphones, and use Ecological Momentary Assessments (EMAs) to trigger appropriate support when needed. EMIs are brief and responsive to the moment. They can monitor alcohol consumption, provide personalized feedback, and deliver coping strategies to help individuals manage their cravings and avoid relapse. EMIs are a promising intervention for AUD, as they can be delivered remotely, are cost-effective, and can be tailored to the individual's needs and preferences [9, 11]. EMIs can be used as standalone interventions or in association with other treatments, and with or without the involvement of a therapist [12]. EMIs are brief and responsive to the “moment.” They can be used to monitor alcohol consumption, provide personalized feedback, and deliver coping strategies to help individuals manage their cravings and avoid relapse [13].

EMIs typically use CBT-related techniques, such as identifying and challenging negative thoughts and beliefs about alcohol, and motivational interviewing techniques, such as enhancing motivation and confidence to change drinking behavior. EMIs also incorporate social support and self-monitoring, essential components of AUD treatment [14]. EMIs are consistent with personalized medicine principles, emphasizing the need to tailor interventions to the individual's unique characteristics and conditions [12].

2.1 Mobile Technologies and EMIs for AUD

Mobile technologies are crucial in delivering Ecological Momentary Interventions (EMIs) for AUD. Mobile technology-based EMI can be effectively implemented as an intervention for various health behaviors and psychological and physical symptoms [10, 11]. Mobile devices allow individuals to receive support in real-time when it is most needed and in the context of their daily lives. Mobile devices also allow for the collection of real-time data on alcohol consumption, mood, and other relevant factors that can be used to tailor the intervention to the individual's needs and preferences. However, challenges associated with implementing EMIs through mobile devices include user engagement and adoption, privacy concerns, and technical issues [10]. Nonetheless, as mobile technologies advance, diminishing consumer prices and user-friendly interfaces allow mobile technology to remain a promising tool for AUD treatment [11].

Many works have been done at the intersection of technology-based EMIS and AUD. For instance, a study evaluated the effectiveness of mobile technology-based EMIs in reducing alcohol consumption among women during Orientation Week [15]. The study found that the intervention group significantly reduced alcohol consumption compared to the control group. Another study examined mobile technology-based EMIs as an intervention for AUD in a clinical setting [10]. The study found that the intervention was feasible, acceptable to patients, and significantly reduced alcohol consumption. Finally, a study investigated the use of EMI for real-time monitoring and intervention related to alcohol

use [16]. The study found that EMI can be delivered via mobile devices when the user needs it, effectively reducing alcohol consumption. While these studies show promising results, they do not provide an entire picture of what might happen in the Mexican context.

Lastly, many studies have detailed the effectiveness of EMIs in reducing risky drinking among young adults. For instance, a randomized controlled trial [17] investigated the efficacy of a mobile EMI for reducing risky drinking among young adults in Australia. The study found that the Mobile Intervention for Drinking in Young People (MIDY) effectively reduced risky drinking. Another study [18] extending MIDY investigated the effectiveness of an ecological momentary intervention for reducing risky alcohol consumption among young adults. The study found that the MIDY intervention effectively reduced dangerous alcohol consumption. These studies suggest that mobile EMIs can reduce risky drinking among young adults. However, more research is needed to fully evaluate their effectiveness and determine these interventions' adequate design and delivery, especially in a country like Mexico.

3 Technology-Based EMIs for AUD: Challenges and Opportunities in Mexico

Implementing technology-based Ecological Momentary Interventions (EMIs) for Alcohol Use Disorder (AUD) in Mexico can pose several challenges that need careful consideration. Issues such as limited access to technology, privacy concerns, language barriers, and the pervasive stigma surrounding AUD treatment can impede the successful implementation of technology-based EMIs.

3.1 Alcohol use and prevention in Mexico

Compared to highly industrialized nations, Mexico's cultural and societal context and technological disparities pose significant hurdles to the widespread adoption and effectiveness of EMIs. According to the World Health Organization (WHO), the 12-month prevalence of any substance use disorder in Mexico is 2.5% [1]. Research in western Mexico has revealed that 61.4% of individuals aged between 12 and 17 have already initiated alcohol consumption [2]. In addition, according to the National Survey on Psychiatric Epidemiology, the lifetime prevalence of alcohol dependence in Mexico is 5.9% [1]. The prevalence of heavy episodic drinking in Mexico is 30.6% for males and 6.1% for females [3]. The consumption of alcohol in Mexico has been increasing, with ever-using alcohol rates rising from 64.7% to 71.3%. Finally, it has also been reported that approximately 60% of the adult population aged 18-65 has a family history of alcohol use [4].

In Mexico, the National Council Against Addictions (CONADIC) addresses AUD and other substance use disorders. CONADIC is a government agency providing promotion, prevention, treatment, and rehabilitation services for individuals with substance use disorders, including AUD. Also, public health services, especially primary healthcare, tend to implement alcohol screening services, brief advice, and referral to more specialized treatment. In most states, the UNEMES-CAPA centers (Specialized Medical Unit in Primary Care Centers for Addictions) are crucial in addressing AUD. These public centers provide specialized medical services and primary care for addiction treatment, including AUD. UNEMES-CAPA centers offer comprehensive assessments, diagnosis, treatment, and follow-up care for individuals struggling with AUD. On the other hand, public health services in Mexico are organized into three levels of care. The first level consists of outpatient services and clinics offered by primary care providers, such as general medicine practitioners. The second level delivers specialized outpatient, hospitalization, and emergency care services. Lastly, the third level encompasses the treatment of complex diseases or conditions, necessitating advanced equipment and specialized facilities. [5]. UNEMES-CAPA centers work with other public health entities, such as primary care clinics, hospitals, and community health centers, to ensure a comprehensive addiction treatment and prevention approach. This collaboration helps provide integrated care, share resources, and leverage expertise to address AUD’s broader public health impact. Nearly 14% of the population lacks financial protection, while the private sector operates independently [6]. In 2012, 48.49% of the Mexican people had no adequate access to health services [7]. The Mexican government has tried to achieve universal health coverage, but these efforts have yet to cover the entire population [8].

We next discuss the challenges that must be addressed to maximize the potential of EMIs in Mexico, shedding light on the unique obstacles faced within this context.

3.2 Cultural, societal, and gender-specific factors

Several cultural, societal, and gender-specific factors may challenge implementing technology-based EMIs for AUD in Mexico. For instance, access to alcohol in Mexico is generally easy, with alcohol being sold in many stores and establishments. The legal age for drinking in Mexico is 18 years old, although enforcement of this law can be lax in some areas [28]. Also, stigma surrounding mental health issues and alcohol use disorders [19], limited access to healthcare services and mental healthcare [8], little financial protection for nearly 14% of the population [6], heterogeneity, inadequate access to health services across different socioeconomic levels and federal states [20], fragmented healthcare system with three main types of service providers and lack of a national mental health law [19] are significant challenges that need to be addressed to be able to implement technology-based EMIs for AUD in Mexico.

Also, Mexican youth may differ from highly industrialized nations in several ways that could affect their drinking behaviors. For instance, cultural factors may affect alcohol use among Mexican youth. Research suggests that social norms differ from Mexicans living in Mexico to individuals of Mexican origin living abroad. Social norms in countries of origin have long-term effects on the drinking patterns of immigrants, and premigration factors such as levels of alcohol use before migration may also be significant. For instance, Mexicans that emigrate to the US before age 14 have higher alcohol consumption rates than those who were older when they emigrated [21,22]. Additionally, a study found that per capita alcohol consumption in Mexico is lower than in North America and Europe. Still, the burden on society seems high, perhaps because of the drinking patterns [23]. Ensuring that the intervention content aligns with the cultural values, beliefs, and practices related to alcohol consumption in Mexico could provide better results when using EMIs for AUD. This involves considering cultural norms, traditions, and social contexts surrounding alcohol use to make the content relatable and acceptable to the target population. For instance, content within the intervention should consider whether the target population is young or adult, the region in Mexico where they live, and the differences between those two cultural and societal factors. Also, considering the diverse cultural landscape in Mexico and avoiding potential cultural stereotypes or biases in the intervention content could provide a significant challenge. It is essential to understand cultural sensitivities surrounding alcohol consumption, such as religious or traditional beliefs, and ensure that the content respects and acknowledges the cultural diversity of the target population. For example, identifying the cultural differences between indigenous groups and regions of the country, such as the northern and southern parts of Mexico.

Lastly, research suggests that there may be some gender-specific factors that contribute to alcohol consumption among youth in Mexico that differ from highly industrialized nations. For instance, a study found that Mexican women's binge drinking in the past month doubled from 4.1% to 10.3% from 2011 to 2016 [24]. On the other hand, in the United States, males continue to exhibit higher alcohol consumption rates. They are more likely to experience and contribute to alcohol-related injuries and fatalities than females [25]. These gender-specific factors may need to be considered when developing interventions to address alcohol use disorders among youth in Mexico. Acknowledging the influence of societal and community factors on alcohol consumption could also provide a challenge. This involves addressing the social norms, peer pressure, and expectations related to drinking behavior within Mexican society.

These factors may affect the implementation of technology-based EMIs for AUD in Mexico, limiting access to healthcare services and mental healthcare. Additionally, cultural factors and gender-specific behaviors, such as stigma surrounding mental health issues and alcohol use disorders and differences between female and male drinking behaviors, may challenge implementing technology-based EMIs for AUD in Mexico.

3.3 Barriers to implementing technology-based EMIs

Limited access to technology, privacy concerns, and stigma associated with seeking help for AUD are potential barriers to implementing technology-based EMIs for AUD in Mexico. For instance, while technology has been identified as a way forward in offering education and healthcare services in Mexico [19,26], limited access to technology may still be a barrier for some individuals seeking help for AUD through technology-based EMIs. The stigma surrounding mental

health issues and alcohol use disorders may also pose a barrier to seeking help for AUD, whether through traditional means or technology-based EMIs. This stigma may prevent individuals from seeking help or disclosing their condition to others [19].

Also, limited access to smartphones or internet connectivity in specific communities, especially the rural part of Mexico, can hinder the implementation of technology-based EMIs. Designing interventions that are engaging and motivational is crucial for sustained user participation. Incorporating interactive elements, personalized feedback, and culturally relevant examples and scenarios could also provide a significant challenge due to the multicultural nature of the population in Mexico. Lastly, privacy concerns may arise when using technology-based EMIs for AUD, as individuals may be hesitant to share personal information or seek help online due to concerns about the security and confidentiality of their data. Data privacy and security in technology-based interventions are essential to protect the confidentiality of users' information. This could be a significant challenge to address, especially when dealing with a population with little to non-technological literacy who could feel a sense of mistrust when dealing with a new type of technology to deliver interventions. Implementing robust data protection measures, complying with local privacy regulations, and providing transparent information about data handling practices are essential for building trust and maintaining participants' privacy.

Lastly, informal discussions with therapists revealed that in some instances, family members restrict access to smartphones to patients in Mexico due to fears that they may be traded or sold for substances, such as drugs or alcohol, which can impede treatment progress [30]. In these instances, there is a need to develop technologies with a low street value that can be used to deliver EMIs, implementing more sophisticated technologies, such as smartphones, could be challenging to the treatment.

These barriers may need to be addressed to implement technology-based EMIs for AUD in Mexico successfully. Strategies such as increasing access to technology, ensuring the security and confidentiality of personal information, and addressing stigma through education and awareness campaigns may help overcome these barriers.

3.4 Language, literacy, and the socioeconomic factors behind the digital divide

Challenges related to language and literacy levels and the digital divide among different socioeconomic groups may pose barriers to implementing technology-based EMIs for AUD in Mexico. First, by 2020, 91.8% of Mexican cell phone users had an intelligent device (i.e., a Smartphone), and 78.3% of the urban population said to be internet users. The user population in rural areas was 50.4 % [27]. Secondly, Mexico has a diverse population with many other languages spoken, with 6.6% of the population over the age of 3 speaking one of the 66 indigenous languages currently spoken in Mexico [31], which may pose a challenge for implementing technology-based EMIs for AUD that are only available in specific languages [27]. Additionally, low literacy rates may make it difficult for some individuals to access and use technology-based EMIs for AUD [19, 26].

The digital divide refers to the gap between those with access to technology and those without access. In Mexico, the digital divide is driven by socioeconomic factors, with marginalized populations needing more access to technology and digital literacy rates [28]. This may limit the ability of some individuals to access technology-based EMIs for AUD. There are significant disparities in access to healthcare services across different socioeconomic groups in Mexico [20]. Also, a study found that low socioeconomic resources and female gender were related to whether Mexicans abstained from alcohol rather than drank without misuse [29]. This may affect the ability of some individuals to access technology-based EMIs for AUD, as those in lower socioeconomic groups may need more access to technology and healthcare services. Adapting the intervention content to the local language, typically Spanish, and using appropriate terminology that resonates with the Mexican population could be a significant challenge due to multiple indigenous languages and variances of the Spanish language. For example, the informal Spanish language and slang used in the northern part of the country differ from the one used in the southern part of the country, which could result in a challenge when deploying nationwide EMIs due to the differences in regional-Spanish variations.

Addressing these challenges may require increasing access to technology and digital literacy programs, providing technology-based EMIs for AUD in multiple languages, and addressing disparities in healthcare services across different socioeconomic groups.

4 Recommendations for Implementation and Research for Technology-based EMIs for AUD in Mexico

Recommendations for implementing and researching EMIs for AUD in Mexico should consider the challenges related to language and literacy levels, the digital divide, and disparities in healthcare services across different socioeconomic groups.

Developing technology-based EMIs for AUD in Mexico that are available in multiple languages can effectively address language barriers. A more comprehensive range of individuals can access and benefit from these resources by offering interventions in Spanish and indigenous languages. For instance, researchers and developers should engage directly with indigenous communities, community leaders, local AUD care centers, and language experts to gain insights into cultural nuances, language preferences, and specific needs related to AUD interventions. This collaboration ensures respectful and inclusive design processes. Also, investing in professional translation and cultural adaptation services to accurately translate EMI content into indigenous languages ensures that EMIs are linguistically and culturally appropriate for the target audience. Lastly, adopting a co-creation approach involving indigenous communities in the development process, such as seeking feedback, conducting pilot studies, and iterating on the design based on community input, could promote cultural sensitivity by respecting traditional knowledge, practices, and values. This approach acknowledges the linguistic diversity in Mexico and ensures cultural sensitivity. It promotes inclusivity, reduces stigma, and fosters trust among individuals seeking help for AUD. User-friendly interfaces and culturally adapted content further enhance engagement. Ultimately, developing EMIs in multiple languages holds great potential to improve access, reach, and effectiveness in addressing AUD in Mexico.

To increase access to technology-based Ecological Momentary Interventions (EMIs) for Alcohol Use Disorder (AUD) among individuals with low literacy rates, it is crucial to provide digital literacy programs. Many individuals with low literacy may need help navigating and utilizing technology effectively. These individuals can acquire the necessary skills to engage with technology-based interventions by offering targeted digital literacy programs. These programs can include basic computer literacy training, smartphone usage guidance, and education on accessing and utilizing specific applications or platforms. They can be taught by healthcare professionals, community organizations, educational institutions collaborating with local AUD care centers, government initiatives, technology experts, and peer support networks. These stakeholders are crucial in providing instruction and guidance on accessing, navigating, and utilizing technology for AUD interventions. For example, messaging applications such as WhatsApp or Telegram could offer a new way to deliver EMIs due to the popularity of those applications among most Mexican mobile phone users. By empowering individuals with low literacy rates to become digitally literate, they can overcome barriers related to technology use, effectively engage with EMIs, and benefit from the support and resources provided. Additionally, these digital literacy programs should be tailored to the specific needs and contexts of individuals in Mexico, considering language, cultural factors, and accessibility requirements to ensure meaningful and impactful participation in technology-based AUD interventions.

To address the digital divide and enhance access to technology-based EMIs for AUD in marginalized communities, it is crucial to prioritize efforts to increase access to technology and improve internet connectivity. Marginalized communities often need to improve technology infrastructure and internet access, limiting their ability to engage with digital interventions. Initiatives should focus on providing affordable or subsidized devices such as smartphones or tablets to individuals in these communities and promoting community centers or public spaces with internet access. Collaborations with local governments, non-profit organizations, and private sectors can help establish or expand internet infrastructure in marginalized areas. Also, considering the possibility of smartphones being traded or sold for substances, health workers and technologists should collaborate closely with local communities and assess the underlying challenges. For instance, exploring alternative technologies or devices that are less likely to be traded, such as feature phones, wearables, or public access points (e.g., internet cafes, community centers, libraries), incorporating security measures, and implementing an integrated approach with counseling and community support can help address the issue. For example, collaborating with local AUD care centers, such as UNEMES-CAPA, to understand and provide educational modules that focus on the consequences of substance abuse and the benefits of treatment, monitoring mechanisms to track engagement and identify potential signs of smartphone trading or selling for substances, and immediate support for

individuals at risk can further enhance the effectiveness and relevance of the interventions while considering the unique context of technology trading for substances in Mexico. By addressing the digital divide, these interventions can reach individuals who may otherwise be excluded, ensuring equitable access to technology-based EMIs and enhancing the potential for positive outcomes in AUD treatment. Addressing the digital divide helps to strengthen comprehension, engagement, and trust in the intervention. Considering the digital divide, low digital literacy rates, and limited access to smartphones or internet connectivity in specific communities, designing interventions accessible to diverse populations, including those with limited technological resources or literacy levels, is essential for equitable reach and impact.

To combat the stigma associated with seeking help for AUD, increasing awareness and education about AUD and the benefits of seeking help through technology-based EMIs is essential. Stigma often acts as a significant barrier, preventing individuals from seeking the support they need. Accurate information about AUD can be disseminated by implementing targeted awareness campaigns, educational initiatives, and community outreach programs. For example, local AUD care centers, such as UNEMES-CAPA, in collaboration with local universities can actively engage in public awareness campaigns to educate the general population about addiction, its nature as a medical condition, and the importance of seeking help. By disseminating accurate information through various media channels, they can work to change misconceptions and challenge stereotypes related to AUD. Educational initiatives can provide culturally sensitive information in schools, workplaces, and healthcare settings, addressing misconceptions and promoting responsible drinking habits. Community outreach programs can engage with local organizations and leaders to facilitate open discussions, workshops, and support groups that encourage individuals with lived experiences to share their stories of recovery. Lastly, collaborating with local AUD care centers, such as UNEMES-CAPA in Mexico, should be prioritized in order to focus on reaching out to vulnerable populations, such as the homeless, indigenous communities, or LGBTQ+ individuals, who might face even higher levels of stigma. Tailoring outreach efforts to specific groups' needs and cultural contexts can be particularly effective. These efforts can emphasize the efficacy and advantages of technology-based EMIs, such as their convenience, confidentiality, and ability to provide personalized support. By highlighting success stories and testimonials from individuals who have benefited from EMIs, the potential to overcome AUD-related challenges can be showcased. Ultimately, by addressing misconceptions, promoting understanding, and emphasizing the positive impact of technology-based interventions, the stigma associated with seeking help for AUD can be diminished, encouraging more individuals to engage with these valuable resources.

By ensuring that healthcare services are accessible, affordable, and tailored to the needs of different socioeconomic groups, we can work towards reducing disparities in access to AUD treatment and improving overall health outcomes for all individuals, regardless of their economic status. Future research should also evaluate the effectiveness of technology-based EMIs for AUD in Mexico, particularly among different socioeconomic groups and language speakers. Additionally, research should explore the feasibility of implementing technology-based EMIs for AUD in various healthcare settings, such as primary care clinics or community health centers, to increase access to these interventions.

5 Conclusions

Technology-based EMIs are promising in addressing the challenges and opportunities for AUD treatment in Mexico. By acknowledging and overcoming obstacles such as language barriers, digital literacy gaps, the digital divide, and the stigma associated with seeking help, EMIs can enhance access, engagement, and effectiveness in AUD interventions. Additionally, increasing awareness, education, and access to healthcare services, particularly in marginalized communities, can reduce disparities and promote equitable access to AUD treatment. By harnessing the potential of technology-based EMIs and addressing the unique needs of the Mexican context, we can advance AUD treatment outcomes, empower individuals, and make significant strides toward a healthier and more inclusive society.

ACKNOWLEDGMENTS

This work was partially funded by the National Council for Humanities, Sciences, and Technologies (CONAHCYT) and the Instituto Tecnológico de Sonora through the PROFAPI program.

REFERENCES

<bib id="bib1"><number>[1]</number>Slone, L. B., Norris, F. H., Rodriguez, F. G., Rodriguez, J. D. J. G., Murphy, A. M., & Perilla, J. L. (2006). Alcohol use and misuse in urban Mexican men and women: An epidemiologic perspective. Drug and Alcohol Dependence, 85(2), 163-170.</bib>
<bib id="bib2"><number>[2]</number>Roman, S., Zepeda-Carrillo, E. A., Moreno-Luna, L. E., & Panduro, A. (2013). Alcoholism and liver disease in Mexico: genetic and environmental factors. World journal of gastroenterology: WJG, 19(44), 7972.</bib>
<bib id="bib3"><number>[3]</number>World Health Organization. (2019). Global status report on alcohol and health 2018. World Health Organization.</bib>
<bib id="bib4"><number>[4]</number>Gómez, R. M., Icaza, M. E. M. M., Velázquez, J. A. V., Gamiño, M. B., Sainz, T., & Gómez-Maqueo, E. L. (2022). Problematic alcohol use in Mexican students: Transmission from parents to children. Salud mental, 45(1), 19-28.</bib>
<bib id="bib5"><number>[5]</number>González Anaya, J. A., & García Cuéllar, R. (2015). The transformation of the Mexican Social Security Institute (IMSS): progress and challenges. Health Systems & Reform, 1(3), 189-199.</bib>
<bib id="bib6"><number>[6]</number>Block, M. Á. G., Morales, H. R., Hurtado, L. C., Balandrán, A., Méndez, E., & World Health Organization. (2020). Mexico: health system review.</bib>
<bib id="bib7"><number>[7]</number>Gutiérrez, J. P., Garcia-Saiso, S., Dolci, G. F., & Ávila, M. H. (2014). Effective access to health care in Mexico. BMC health services research, 14(1), 1-9.</bib>
<bib id="bib8"><number>[8]</number>Garcia-Diaz, R. (2022). Effective access to health care in Mexico. BMC Health Services Research, 22(1), 1-11.</bib>
<bib id="bib9"><number>[9]</number>Dao, K. P., De Cocker, K., Tong, H. L., Kocaballi, A. B., Chow, C., & Laranjo, L. (2021). Smartphone-delivered ecological momentary interventions based on ecological momentary assessments to promote health behaviors: systematic review and adapted checklist for reporting ecological momentary assessment and intervention studies. JMIR mHealth and uHealth, 9(11), e22890.</bib>
<bib id="bib10"><number>[10]</number>Heron, K. E., & Smyth, J. M. (2010). Ecological momentary interventions: incorporating mobile technology into psychosocial and health behaviour treatments. British journal of health psychology, 15(1), 1-39.</bib>
<bib id="bib11"><number>[11]</number>Colombo, D., Fernández-Álvarez, J., Patané, A., Semonella, M., Kwiatkowska, M., García-Palacios, A., ... & Botella, C. (2019). Current state and future directions of technology-based ecological momentary assessment and intervention for major depressive disorder: a systematic review. Journal of clinical medicine, 8(4), 465.</bib>
<bib id="bib12"><number>[12]</number>Parmar, A., & Sharma, P. (2017). Ecological momentary interventions delivered by smartphone apps: applications in substance use treatment in indian scenario. Indian journal of psychological medicine, 39(1), 102-103.</bib>
<bib id="bib13"><number>[13]</number>McDevitt-Murphy, M. E., Luciano, M. T., & Zakarian, R. J. (2018). Use of ecological momentary assessment and intervention in treatment with adults. Focus, 16(4), 370-375.</bib>
<bib id="bib14"><number>[14]</number>Balaskas, A., Schueller, S. M., Cox, A. L., & Doherty, G. (2021). Ecological momentary interventions for mental health: A scoping review. PloS one, 16(3), e0248152.</bib>
<bib id="bib15"><number>[15]</number>Riordan, B. C., Conner, T. S., Flett, J. A., & Scarf, D. (2015). A brief orientation week ecological momentary intervention to reduce university student alcohol consumption. Journal of Studies on Alcohol and Drugs, 76(4), 525-529.</bib>
<bib id="bib16"><number>[16]</number>Beckjord, E., & Shiffman, S. (2014). Background for real-time monitoring and intervention related to alcohol use. Alcohol research: current reviews, 36(1), 9.</bib>
<bib id="bib17"><number>[17]</number>Wright, C., Dietze, P. M., Agius, P. A., Kuntsche, E., Livingston, M., Black, O. C., ... & Lim, M. S. (2018). Mobile phone-based ecological momentary intervention to reduce young adults' alcohol use in the event: A three-armed randomized controlled trial. JMIR mHealth and uHealth, 6(7), e9324.</bib>
<bib id="bib18"><number>[18]</number>Wright, C., Dietze, P. M., Kuntsche, E., Livingston, M., Agius, P. A., Room, R., ... & Lim, M. S. (2020). Effectiveness of an ecological momentary intervention for reducing risky alcohol consumption among young adults: Protocol for a three-arm randomized controlled trial. JMIR Research Protocols, 9(3), e14190.</bib>
<bib id="bib19"><number>[19]</number>Gómez-Merino, F. C., Trejo-Téllez, L. I., Méndez-Cadena, M. E., & Hernández-Cázares, A. S. (2017). Education, Science and Technology in Mexico: Challenges for Innovation. International Education Studies, 10(5), 115-128.</bib>
<bib id="bib20"><number>[20]</number>OECD (2016), OECD Reviews of Health Systems: Mexico 2016, OECD Publishing, Paris. http://dx.doi.org/10.1787/9789264230491-en</bib>
<bib id="bib21"><number>[21]</number>Reingle, J. M., Caetano, R., Mills, B. A., & Vaeth, P. A. (2014). The Role of Immigration Age on Alcohol and Drug Use Among Border and Non-Border Mexican Americans. Alcoholism: Clinical and Experimental Research, 38(7), 2080-2086.</bib>
<bib id="bib22"><number>[22]</number>Sudhinaraset, M., Wigglesworth, C., & Takeuchi, D. T. (2016). Social and cultural contexts of alcohol use: Influences in a social–ecological framework. Alcohol research: current reviews.</bib>
<bib id="bib23"><number>[23]</number>Medina-Mora, M. E. (2007). Mexicans and alcohol: patterns, problems and policies. Addiction, 102(7), 1041-1045.</bib>
<bib id="bib24"><number>[24]</number>Reséndiz Escobar, E., Bustos Gamiño, M. N., Mujica Salazar, R., Soto Hernández, I. S., Cañas Martínez, V., Fleiz Bautista, C., ... & Villatoro Velázquez, J. A. (2018). National trends in alcohol consumption in Mexico: results of the National Survey on Drug, Alcohol and Tobacco Consumption 2016-2017. Salud mental, 41(1), 7-15.</bib>
<bib id="bib25"><number>[25]</number>White A. M. (2020). Gender Differences in the Epidemiology of Alcohol Use and Related Harms in the United States. Alcohol research: current reviews, 40(2), 01. https://doi.org/10.35946/arcr.v40.2.01</bib>
<bib id="bib26"><number>[26]</number>Ontiveros, M., de la Barquera, S., & Pazos, J. R. C. (2013). Education and Technology in Mexico and Latin America: Outlook and Challenges. Introduction. RUSC: Revista de Universidad y Sociedad del Conocimiento, 10(2).</bib>
<bib id="bib27"><number>[27]</number>INEGI, I. (2021). En México hay 84.1 millones de usuarios de Internet y 88.2 millones de usuarios de teléfonos celulares: Endutih 2020.</bib>
<bib id="bib28"><number>[28]</number>Curry, J., & Kenney, M. (2007). Digital divide or digital development?: The Internet in Mexico (originally published in March 2006). First Monday.</bib>
<bib id="bib29"><number>[29]</number>Slone, L. B., Norris, F. H., Rodriguez, F. G., Rodriguez, J. D. J. G., Murphy, A. M., & Perilla, J. L. (2006). Alcohol use and misuse in urban Mexican men and women: An epidemiologic perspective. Drug and Alcohol Dependence, 85(2), 163-170.</bib>
<bib id="bib30"><number>[30]</number>Gutierrez, L. J., Castro, L. A., & Banos, O. (2022). Integrating Pervasive Technologies Into Mental Health Services: A Qualitative Study in Mexico. IEEE Pervasive Computing, 21(4), 74-81.</bib>
<bib id="bib31"><number>[31]</number>Busquets, M. B., Saraví, G. A., & Abrantes, P. (2013). Adolescentes indígenas en México: derechos e identidades emergentes. CIESAS.</bib>