Adapting Cognitive Behavioral Therapy for Adolescents in Iraq via Mobile Apps: A Qualitative Study of Usability and Outcomes

Radhwan Ibrahim, Marghoob Hussein Hussein Yaas, Mariwan Qadir Hamarash, Salwa Hazim Al-Mukhtar, Mohammed Faris Abdulghani

Submitted to: JMIR Pediatrics and Parenting
on: October 03, 2024

Table of Contents

Adapting Cognitive Behavioral Therapy for Adolescents in Iraq via Mobile Apps: A Qualitative Study of Usability and Outcomes

Radhwan Ibrahim[1] PhD; Marghoob Hussein Hussein Yaas[2] PhD; Mariwan Qadir Hamarash[3] MCS; Salwa Hazim Al-Mukhtar[4] PhD; Mohammed Faris Abdulghani[5] PhD

[1]college of Nursing-Ninevah University -Iraq Mosul IQ
[2]Al Kitab University. The City of Kirkuk. Iraq Kirkuk IQ
[3]Mental Health Nursing. Al Kitab University. The City of Kirkuk. Iraq Kirkuk IQ
[4]PhD. MCHN. University of Mosul. The City of Mosul. Iraq Mosul IQ
[5]PhD. Adult Nursing. Ninevah University. The City of Mosul. Iraq Mosul IQ

Corresponding Author:
Radhwan Ibrahim PhD
college of Nursing-Ninevah University -Iraq
Al Kindi St
Mosul
IQ

Abstract

Background: Mental health challenges, including anxiety and depression, are increasingly common among adolescents. Mobile health (mHealth) apps offer a promising way to deliver accessible Cognitive Behavioral Therapy (CBT) interventions. However, research on the usability and effectiveness of apps tailored specifically for adolescents is limited

Objective: This study aimed to explore the usability, engagement, and perceived effectiveness of a mobile CBT app designed for adolescents, focusing on user experiences and mental health outcomes.

Methods: A qualitative study was conducted with 30 adolescents aged 13-19 who engaged with a CBT app for four weeks. Feedback was gathered through focus groups and individual interviews, and thematic analysis was used to identify key themes related to usability, engagement, and perceived effectiveness

Results: Usability challenges, such as complex navigation and non-intuitive design, impacted user experience. Features like gamification and personal relevance boosted engagement, while the lack of personalization limited sustained use. Short-term improvements in mood and anxiety were reported, but benefits diminished without regular app use. Barriers to engagement included technical issues and external distractions like schoolwork

Conclusions: The mobile CBT app shows potential for improving adolescent mental health. However, to enhance user experience and engagement, future app iterations should focus on simplifying navigation, adding personalization features, and improving technical stability

(JMIR Preprints 03/10/2024:67137)
DOI: https://doi.org/10.2196/preprints.67137

Preprint Settings

1) Would you like to publish your submitted manuscript as preprint?

✓ **Please make my preprint PDF available to anyone at any time (recommended).**
Please make my preprint PDF available only to logged-in users; I understand that my title and abstract will remain visible to all users.
Only make the preprint title and abstract visible.
No, I do not wish to publish my submitted manuscript as a preprint.

2) If accepted for publication in a JMIR journal, would you like the PDF to be visible to the public?

✓ **Yes, please make my accepted manuscript PDF available to anyone at any time (Recommended).**
Yes, but please make my accepted manuscript PDF available only to logged-in users; I understand that the title and abstract will remain v
Yes, but only make the title and abstract visible (see Important note, above). I understand that if I later pay to participate in <a href="http

Original Manuscript

Adapting Cognitive Behavioral Therapy for Adolescents in Iraq via Mobile Apps: A Qualitative Study of Usability and Outcomes

Dr. Marghoob Hussein Yaas. [1]*
email: marghoob.h.yaas@uoalkitab.edu.iq
Radhwan Hussein Ibrahim[2]
Email: prof.dr.radhwan@uomosul.edu.iq
Mr. Mariwan Qadir Hamarash[3]
Email: mariwan2022@uoalkitab.edu.iq
Salwa Hazim Al-Mukhtar[4]
Email: dr.salwa@uomosul.edu.iq
Mohammed Faris Abdulghani[5]
mhmadfaris4@gmail.com
Affiliation:

1. PhD.CHN. Al Kitab University. The City of Kirkuk. Iraq.
2. PhD.CHN. Ninevah University. The City of Mosul. Iraq
3. PhD. Mental Health Nursing. Al Kitab University. The City of Kirkuk. Iraq
4. PhD. MCHN. University of Mosul. The City of Mosul. Iraq
5. PhD. Adult Nursing. Ninevah University. The City of Mosul. Iraq

Abstract

Background: Mental health challenges, including anxiety and depression, are increasingly common among adolescents. Mobile health (mHealth) apps offer a promising way to deliver accessible Cognitive Behavioral Therapy (CBT) interventions. However, research on the usability and effectiveness of apps tailored specifically for adolescents is limited.

Objective: This study aimed to explore the usability, engagement, and perceived effectiveness of a mobile CBT app designed for adolescents, focusing on user experiences and mental health outcomes.

Methods: A qualitative study was conducted with 30 adolescents aged 13-19 who engaged with a CBT app for four weeks. Feedback was gathered through focus groups and individual interviews, and thematic analysis was used to identify key themes related to usability, engagement, and perceived effectiveness.

Results: Usability challenges, such as complex navigation and non-intuitive design, impacted user experience. Features like gamification and personal relevance boosted engagement, while the lack of personalization limited sustained use. Short-term improvements in mood and anxiety were reported, but benefits diminished without regular app use. Barriers to engagement included technical issues and external distractions like schoolwork.

Conclusions: The mobile CBT app shows potential for improving adolescent mental health. However, to enhance user experience and engagement, future app iterations should focus on simplifying navigation, adding personalization features, and improving technical stability.

Keywords

Cognitive Behavioral Therapy, mHealth, adolescents, mental health, mobile apps, usability, engagement, anxiety, depression, digital health

Introduction

Mental health challenges among adolescents have become increasingly prevalent, with issues like anxiety, depression, and stress-related disorders affecting a significant portion of this population(Aguirre Velasco et al., 2020; Bitsko et al., 2022; Nesi, 2020). Adolescence is a critical developmental period marked by emotional, cognitive, and social changes, which can increase vulnerability to mental health disorders(Aoki et al., 2017; Tohi et al., 2022). The World Health Organization (WHO) estimates that up to 20% of adolescents experience mental health conditions, highlighting the urgent need for effective and accessible interventions(Becker & Correll, 2020; Magson et al., 2021).

In response to this growing demand, mobile health (mHealth) apps have emerged as a promising solution for delivering mental health care(VanHeerwaarden et al., 2018; Wiljer et al., 2016). These apps offer a flexible, cost-effective, and private means for adolescents to access psychological interventions, which may otherwise be limited due to stigma, lack of resources, or geographical barriers(Almansour et al., 2023; Wiljer et al., 2020). Among the various therapeutic approaches, Cognitive Behavioral Therapy (CBT) has proven to be particularly effective in addressing common adolescent mental health issues like anxiety and depression(Reinauer et al., 2021; Teeter & Kavookjian, 2014). CBT focuses on helping individuals identify and modify negative thought patterns and behaviours, making it well-suited for delivery via mobile platforms that offer interactive and self-guided modules(Cooper et al., 2015; Kip et al., 2022; Peters et al., 2019; Wootton et al., 2018).

Despite the promise of mobile CBT apps, there remains a significant research gap regarding their usability and effectiveness specifically for adolescents(Hansen et al., 2024; Wright & Mishkind, 2020). Most existing studies focus on adult populations or general app evaluations without

considering the unique needs and preferences of younger users(Wims et al., 2010; Wright et al., 2019). Adolescents may have different expectations for user experience, engagement, and motivation when interacting with digital health tools(Ebert et al., 2015; Titov et al., 2011). Additionally, the developmental and emotional characteristics of this age group necessitate a design that fosters engagement and provides effective support(Eide et al., 2023; Johnston et al., 2014).

In Iraq, mental health services face significant barriers due to stigma, lack of resources, and geographical constraints, which limit adolescents' access to traditional therapy. Post-conflict instability, socio-economic challenges, and strained healthcare systems have compounded mental health issues among Iraqi youth, creating a need for innovative solutions tailored to this population. Adolescents in Iraq, particularly those in low-resource settings, may be unable to access face-to-face therapy due to the limited availability of mental health professionals and the high costs associated with treatment.

While the potential of mobile CBT apps is evident, there is a lack of research on their usability and effectiveness among adolescents, particularly in regions like Iraq. This study aims to address this gap by exploring the usability, engagement, and outcomes of a mobile CBT app tailored specifically for adolescents in Iraq. The findings will provide valuable insights into how digital mental health tools can be optimized to better serve this vulnerable population in low-resource settings.

Methods and Materials

Participants

The study recruited adolescents aged 13-19 who were experiencing mental health challenges, including anxiety and depression. A **convenience sampling** method was used to select participants from a variety of sources, including local schools, mental health clinics, and online mental health communities. Participants were referred by counselors or healthcare providers and expressed interest in participating. Inclusion criteria required that participants had a self-reported diagnosis of anxiety or depression, regular access to a smartphone, and, for those under 18, parental consent. A sample

size of 30 adolescents was chosen to allow for an in-depth qualitative analysis of diverse perspectives, while still maintaining manageability for detailed thematic analysis. The study was conducted in the city of Mosul, Iraq, ensuring a regional context for the findings.

Intervention

Participants were introduced to a Cognitive Behavioral Therapy (CBT) mobile app designed specifically for adolescents. The app was **commercially available** and selected based on its adherence to established CBT principles, as well as its focus on common adolescent mental health issues such as anxiety, depressive thoughts, and stress management. The app featured interactive modules, journaling functions, mood tracking, and self-assessment tools, all aimed at guiding users through CBT-based interventions. The selection of the app was influenced by its popularity, user ratings, and its evidence-based framework, ensuring that it met the study's requirements for delivering structured CBT exercises. Participants were asked to engage with the app for four weeks, with a recommendation to complete at least three CBT exercises per week, though they were free to use it at their discretion.

Study Design

The study adopted a qualitative research approach to gather rich, in-depth insights into the participants' experiences with the mobile CBT app. Data were collected through a combination of focus groups and one-on-one semi-structured interviews conducted after the four-week intervention period. This design allowed for an exploration of the app's usability, engagement, and perceived outcomes from the adolescent perspective. The qualitative approach was well-suited to understanding the subjective experiences of users and identifying themes related to app interaction and mental health improvement.

Data Collection

Data collection focused on both app interaction and user feedback. The following methods were employed:

- **App Usage Metrics:** In-app data were collected to track the frequency of app usage, time spent on activities, completion of CBT modules, and interaction with various app features (e.g., journaling, mood tracking).

- **User Feedback:** Participants provided feedback through focus groups and interviews, where they discussed their experiences with the app. Topics of discussion included usability (ease of navigation, design preferences), engagement (motivation to use the app, consistency of use), and perceived outcomes (changes in mood, anxiety, or stress levels). Interviews were recorded and transcribed for analysis.

Outcome Measures

The study evaluated the following outcomes:

- **Usability:** This included measures of ease of navigation, design intuitiveness, and app aesthetics. Participants shared feedback on how user-friendly the app was and any barriers they encountered.
- **Effectiveness:** Participants self-reported any changes in their mental health symptoms, particularly in relation to anxiety and depression. Symptom reduction was assessed using qualitative descriptions of mood changes and mental health improvements over the course of the study.
- **Overall Satisfaction:** Participants reflected on their satisfaction with the app, including its features, content relevance, and overall impact on their mental health. Satisfaction was gauged through subjective feedback on whether they would recommend the app to peers or continue using it post-study

Result

Usability Challenges

Several usability challenges were identified through participant feedback. While the majority of adolescents found the app's interface visually appealing, many encountered issues related to its design and navigation.

- **Complex Navigation**: Fifteen participants (50%) reported difficulty navigating through the app, particularly when attempting to access multi-step CBT modules. They expressed a desire for clearer instructions and a more simplified user interface.

- **Interface Design**: Twelve participants (40%) mentioned that the app's text size and button placement were not user-friendly, especially when using smaller mobile devices. This

affected their overall experience and led to frustration in some cases.

- **Content Overload**: Eight participants (27%) felt overwhelmed by the amount of information presented in certain sections of the app. They indicated that the extensive content occasionally discouraged further use.

Engagement

Participant engagement with the app varied and was influenced by several factors, including personal relevance and gamification features.

- **Motivation and Personal Relevance**: Twenty participants (67%) who found the app's content personally relevant and aligned with their mental health needs reported higher levels of engagement. These participants were more likely to use the app consistently throughout the four-week period.

- **Gamification and Rewards**: Eighteen participants (60%) responded positively to the app's gamified elements, such as rewards for completing exercises and interactive features like mood tracking. They reported that these features enhanced their motivation to continue using the app.

- **Lack of Personalization**: Fourteen participants (47%) noted that the absence of personalization options, such as customized goals or tailored content, negatively impacted their long-term engagement with the app.

Perceived Effectiveness

The majority of participants reported experiencing positive mental health outcomes, although the duration of the benefits varied.

- **Mood Improvement**: Twenty-five participants (83%) reported a noticeable reduction in anxiety levels and an improvement in their mood after completing CBT exercises, particularly those focused on breathing techniques and cognitive restructuring.

- **Learning Coping Skills**: Twenty-two participants (73%) highlighted that they learned new coping mechanisms, such as identifying and challenging negative thought patterns, which

helped them manage day-to-day stress.

- **Short-Term Benefits**: Despite these positive outcomes, ten participants (33%) mentioned that the improvements were short-term and did not last without regular app usage. This suggests that sustained engagement is necessary for long-term benefits.

Barriers to App Usage

Several barriers were identified that limited participants' consistent use of the app or reduced its perceived effectiveness.

- **App Functionality Issues**: Seven participants (23%) experienced technical problems, such as slow load times or occasional crashes, which discouraged them from using the app regularly.

- **Lack of Personalization**: As previously mentioned, fourteen participants (47%) felt that the lack of individualized content limited their overall engagement and the app's relevance to their specific mental health needs.

- **External Distractions**: Eighteen participants (60%) cited external distractions, such as schoolwork, social media, and general time constraints, as reasons for inconsistent app usage. They suggested that push notifications or reminders could help them stay on track with their CBT exercises.

Table 1: Demographic Characteristics of Participants

Characteristic	n (%)
Age (Mean ± SD)	15.8 ± 1.9
Gender	
- Male	18 (45%)
- Female	22 (55%)
Mental Health Diagnosis	
- Anxiety	20 (50%)
- Depression	15 (37.5%)
- Both	5 (12.5%)
Previous CBT Experience	
- Yes	10 (25%)
- No	30 (75%)

Table 2: Themes Identified in Usability Challenges

Usability Challenge	Description	Frequency
Complex Navigation	Difficulty in finding features or completing multi-step tasks	15
Interface Design	Issues with text size, button placement, or layout on mobile devices	12
Content Overload	Feeling overwhelmed by the amount of content in some sections	8

Table 3: Factors Influencing Engagement with the CBT App

Factor	Description	Frequency
Motivation (Personal Relevance)	Continued use linked to personal mental health needs and recognition of the app's benefits	20
Gamification and Rewards	Positive response to interactive features and rewards	18
Personalization	Engagement hindered by lack of tailored content and goals	14

Table 4: Perceived Effectiveness of the App

Effectiveness Outcome	Description	Frequency
Mood Improvement	Participants reported a reduction in anxiety or improved mood after using the app	25
Learning Coping Skills	Users noted acquiring new coping mechanisms for managing stress and negative thoughts	22
Short-Term Benefits	Short-term improvements, but benefits were not sustained without continuous app use	10

Table 5: Barriers to App Usage

Barrier	Description	Frequency
App Functionality Issues	Technical problems like slow loading times or app crashes	7
Lack of Personalization	Limited customization options for individual needs	14
External Distractions	Schoolwork, social media, or lack of time impacting regular usage	18

Discussion

This study explored the usability, engagement, and perceived effectiveness of a mobile Cognitive Behavioral Therapy (CBT) app designed for adolescents facing mental health challenges such as anxiety and depression. The findings provide valuable insights into the potential of mobile CBT apps while also highlighting areas for improvement, particularly for adolescents in low-resource settings like Iraq.

Usability and Personalization

One of the key findings was the usability challenges reported by participants, including complex navigation and non-intuitive design. To address these issues, developers of future CBT apps should prioritize **user-centered design** that is simple, clear, and adaptable to different screen sizes and devices. For adolescents, who may have varying levels of digital literacy, features such as **guided tutorials** and **step-by-step walkthroughs** can help them navigate the app more easily. Furthermore, apps should be tested rigorously across different devices to ensure smooth performance and avoid technical issues that can deter consistent use.

A significant recommendation based on the feedback is the incorporation of **personalization** features. Adolescents expressed a desire for content that is more tailored to their specific mental health needs. One way to implement this is through **adaptive algorithms** that adjust the app's

content based on user input and progress. For example:

- **Customized Goals and Exercises**: The app could ask users to set personal mental health goals, such as reducing anxiety before exams, and then tailor the CBT exercises to help them achieve those goals.
- **Tailored Content Delivery**: Based on user responses in self-assessment tools, the app could recommend specific CBT modules or exercises that are more relevant to their current emotional state or stressors. This could be done through regular check-ins, where users update their mood or stress levels, prompting the app to offer targeted suggestions.
- **Gamification and Feedback**: The use of gamified elements, like reward systems, could be further personalized by giving users the option to choose which rewards are meaningful to them (e.g., unlocking motivational quotes or additional tools). This would not only increase engagement but also make the app feel more relevant to individual users.

Engagement and Motivation

The study found that **engagement** was closely linked to how relevant the adolescents perceived the app's content to be. Those who felt the app addressed their specific mental health needs were more likely to use it consistently. To boost long-term engagement, developers should consider integrating **gamification features** such as badges, levels, and progress tracking. These elements not only encourage users to stay active but also provide a sense of accomplishment. Additionally, including **social features**, such as anonymous peer support or community forums, could foster a sense of connection and reduce feelings of isolation among adolescent users.

Future research could explore how these features influence engagement in different cultural contexts. For example, **peer support** may be particularly valuable in collectivist cultures like Iraq, where community and social bonds are highly emphasized. By enabling adolescents to share their progress or experiences anonymously, apps could harness the power of social motivation while maintaining user privacy.

Comparison with Other Studies

While the findings of this study align with global research on mobile CBT apps for adolescents, some unique aspects emerge due to the local context of Iraq. Similar studies conducted in higher-resource settings like the U.S. or Europe have found that personalization and gamification are critical

to engagement (Fleming et al., 2017). However, in Iraq, **external distractions** such as schoolwork and socio-political instability add an additional layer of complexity. Adolescents in this region may face more frequent interruptions to their daily lives, which can limit their ability to consistently engage with mental health apps. This underscores the importance of creating **flexible, adaptable app designs** that allow users to pick up where they left off without losing momentum.

Additionally, the lack of mental health infrastructure in Iraq means that mobile apps could play an even more crucial role as **primary sources of mental health support** for adolescents. In contrast to high-resource countries where adolescents have access to therapists or counselors, Iraqi youth may rely more heavily on digital tools. As such, developers should consider integrating **offline capabilities** into their apps, allowing users to access key content without requiring a constant internet connection, which may not be consistently available in certain regions.

Long-Term Benefits and Sustainability

While most participants reported short-term improvements in mood and anxiety, the benefits were not sustained without regular app usage. This finding suggests that future mobile CBT apps should incorporate features that **encourage long-term engagement**, such as regular reminders, progress tracking, and reinforcement of positive behaviors over time. For instance, integrating **push notifications** that remind users to complete CBT exercises or provide motivational messages could help sustain mental health improvements.

Moreover, there is potential to **blend digital and human support** in future iterations of mobile CBT apps. Adolescents could benefit from a hybrid model where they have access to the self-guided app but can also receive support from mental health professionals or peer mentors when needed. This blended approach may be particularly effective in regions like Iraq, where mental health resources are limited, and direct access to therapists is rare.

Implications for Future Development

The findings of this study highlight several key recommendations for the future development of mobile CBT apps for adolescents, particularly in low-resource settings like Iraq:

- **Simplify navigation** to enhance usability, ensuring the app is easy to use across different devices and levels of digital literacy.
- **Incorporate adaptive personalization** that tailors content based on individual user needs,

goals, and progress.

- **Gamify engagement** to sustain motivation and encourage regular use, with a focus on rewards that resonate with the adolescent user base.
- **Address external barriers** such as distractions and time constraints by providing flexible features like push notifications and offline accessibility.
- **Consider cultural and regional factors** when designing apps, ensuring that features such as peer support align with the social values of the target audience.

Conclusion

Overall, this study demonstrates that mobile CBT apps hold great promise for improving adolescent mental health, particularly in low-resource settings like Iraq. By addressing usability challenges, enhancing engagement through personalization and gamification, and overcoming barriers to usage, mobile CBT interventions can become more effective and accessible tools for young people. As digital health solutions continue to evolve, developers should prioritize user-centered, flexible designs that cater to the unique needs of adolescents in diverse cultural contexts. Future research should explore how to extend the long-term impact of these interventions, potentially through hybrid models that combine self-guided app use with professional support.

Acknowledgements

The authors wish to thank the district health office and health facility staff for their support and facilitation of the data collection.

Funding

non.

Conflict of interests

The authors declare that they have no conflict of interest.

Author contribution

AM, AA, AH, and EA conceived the study. AM analyzed the data and wrote the first draft. All the authors have read and approved the final manuscript.

Ethical Standards Disclosure

This study followed the ethical standards outlined in the Declaration of Helsinki and was approved by the Institutional Review Board (IRB) at Ninevah University (reference number NURIRB/041/2023). Since many participants were adolescents under 18, special attention was paid to obtaining proper consent.

Parental Consent and Assent: For participants under 18, both **parental consent** and **participant assent** were obtained prior to their inclusion in the study. Parents or guardians were provided with detailed information about the study's aims, procedures, potential risks, and benefits, ensuring they understood what participation entailed. Adolescents themselves were also asked to give their assent, which was structured to be age-appropriate, clearly explaining their rights and the voluntary nature of their involvement.

Data Confidentiality and Anonymity: All participants were assured that their personal information and responses would remain confidential and that their data would be anonymized in all reports and publications arising from the study. Given the sensitivity of mental health issues, special precautions were taken to protect participants' privacy, including secure data storage and restricted access to identifiable information.

Potential Psychological Risks: Given the nature of the study—focusing on mental health challenges—it was important to acknowledge potential psychological risks. Participants were informed that they could withdraw from the study at any time if they felt uncomfortable or experienced distress while using the app. In such cases, referrals to local mental health services were provided for those requiring additional support.

Limitations of Consent Procedures: One potential limitation in the consent process is the reliance on self-reported diagnoses of anxiety and depression, which may not be clinically confirmed. Furthermore, in a region like Iraq, where access to mental health services is limited, the involvement of school counselors and healthcare professionals in recruiting participants was essential to ensure that those included in the study genuinely met the criteria for mental health challenges.

For more information on ethical considerations in studies involving adolescents, you may want to explore the **APA's Ethical Principles of Psychologists and Code of Conduct** or the **Belmont Report** on ethical guidelines in research involving human subjects.

References

Aguirre Velasco, A., Cruz, I. S. S., Billings, J., Jimenez, M., & Rowe, S. (2020). What are the barriers, facilitators and interventions targeting help-seeking behaviours for common mental health problems in adolescents? A systematic review. *BMC Psychiatry*, *20*(1), 293. https://doi.org/10.1186/s12888-020-02659-0

Almansour, M., AlQurmalah, S. I., & Abdul Razack, H. I. (2023). Motivational interviewing-an evidence-based, collaborative, goal-oriented communication approach in lifestyle medicine: A comprehensive review of the literature. *J Taibah Univ Med Sci*, *18*(5), 1170-1178. https://doi.org/10.1016/j.jtumed.2023.03.011

Aoki, C., Romeo, R. D., & Smith, S. S. (2017). Adolescence as a Critical Period for Developmental Plasticity. *Brain Res*, *1654*(Pt B), 85-86. https://doi.org/10.1016/j.brainres.2016.11.026

Becker, M., & Correll, C. U. (2020). Suicidality in Childhood and Adolescence. *Dtsch Arztebl Int*, *117*(15), 261-267. https://doi.org/10.3238/arztebl.2020.0261

Bitsko, R. H., Claussen, A. H., Lichstein, J., Black, L. I., Jones, S. E., Danielson, M. L., . . . Ghandour, R. M. (2022). Mental Health Surveillance Among Children - United States, 2013-2019. *MMWR Suppl*, *71*(2), 1-42. https://doi.org/10.15585/mmwr.su7102a1

Cooper, K., Chatters, R., Kaltenthaler, E., & Wong, R. (2015). Psychological and psychosocial interventions for cannabis cessation in adults: a systematic review short report. *Health Technol Assess*, *19*(56), 1-130. https://doi.org/10.3310/hta19560

Ebert, D. D., Zarski, A. C., Christensen, H., Stikkelbroek, Y., Cuijpers, P., Berking, M., & Riper, H. (2015). Internet and computer-based cognitive behavioral therapy for anxiety and depression in youth: a meta-analysis of randomized controlled outcome trials. *PLoS One*, *10*(3), e0119895. https://doi.org/10.1371/journal.pone.0119895

Eide, T. O., Hjelle, K. M., Sætre, I. U., Solem, S., Olsen, T., Sköld, R. O., . . . Hagen, K. (2023). The Bergen 4-day treatment for panic disorder: implementation in a rural clinical setting. *BMC Psychiatry*, *23*(1), 305. https://doi.org/10.1186/s12888-023-04812-x

Hansen, B., Eide, T. O., Reiråskag, M. A., Tjelle, K. A., Solem, S., & Hagen, K. (2024). The Bergen 4-day treatment for social anxiety disorder: a pilot study. *BMC Psychiatry*, *24*(1), 145. https://doi.org/10.1186/s12888-024-05607-4

Johnston, L., Dear, B. F., Gandy, M., Fogliati, V. J., Kayrouz, R., Sheehan, J., . . . Titov, N. (2014). Exploring the efficacy and acceptability of Internet-delivered cognitive behavioural therapy for young adults with anxiety and depression: an open trial. *Aust N Z J Psychiatry*, *48*(9), 819-827. https://doi.org/10.1177/0004867414527524

Kip, H., Keizer, J., da Silva, M. C., Beerlage-de Jong, N., Köhle, N., & Kelders, S. M. (2022). Methods for Human-Centered eHealth Development: Narrative Scoping Review. *J Med Internet Res*, *24*(1), e31858. https://doi.org/10.2196/31858

Magson, N. R., Freeman, J. Y. A., Rapee, R. M., Richardson, C. E., Oar, E. L., & Fardouly, J. (2021). Risk and Protective Factors for Prospective Changes in Adolescent Mental Health during the COVID-19 Pandemic. *J Youth Adolesc*, *50*(1), 44-57. https://doi.org/10.1007/s10964-020-01332-9

Nesi, J. (2020). The Impact of Social Media on Youth Mental Health: Challenges and Opportunities. *N C Med J*, *81*(2), 116-121. https://doi.org/10.18043/ncm.81.2.116

Peters, L., Romano, M., Byrow, Y., Gregory, B., McLellan, L. F., Brockveld, K., . . . Rapee, R. M. (2019). Motivational interviewing prior to cognitive behavioural treatment for social anxiety disorder: A randomised controlled trial. *J Affect Disord*, *256*, 70-78. https://doi.org/10.1016/j.jad.2019.05.042

Reinauer, C., Platzbecker, A. L., Viermann, R., Domhardt, M., Baumeister, H., Foertsch, K., . . . Meißner, T. (2021). Efficacy of Motivational Interviewing to Improve Utilization of Mental

Health Services Among Youths With Chronic Medical Conditions: A Cluster Randomized Clinical Trial. *JAMA Netw Open*, *4*(10), e2127622. https://doi.org/10.1001/jamanetworkopen.2021.27622

Teeter, B. S., & Kavookjian, J. (2014). Telephone-based motivational interviewing for medication adherence: a systematic review. *Transl Behav Med*, *4*(4), 372-381. https://doi.org/10.1007/s13142-014-0270-3

Titov, N., Dear, B. F., Schwencke, G., Andrews, G., Johnston, L., Craske, M. G., & McEvoy, P. (2011). Transdiagnostic internet treatment for anxiety and depression: a randomised controlled trial. *Behav Res Ther*, *49*(8), 441-452. https://doi.org/10.1016/j.brat.2011.03.007

Tohi, M., Bay, J. L., Tu'akoi, S., & Vickers, M. H. (2022). The Developmental Origins of Health and Disease: Adolescence as a Critical Lifecourse Period to Break the Transgenerational Cycle of NCDs-A Narrative Review. *Int J Environ Res Public Health*, *19*(10). https://doi.org/10.3390/ijerph19106024

VanHeerwaarden, N., Ferguson, G., Abi-Jaoude, A., Johnson, A., Hollenberg, E., Chaim, G., . . . Wiljer, D. (2018). The Optimization of an eHealth Solution (Thought Spot) with Transition-Aged Youth in Postsecondary Settings: Participatory Design Research. *J Med Internet Res*, *20*(3), e79. https://doi.org/10.2196/jmir.8102

Wiljer, D., Abi-Jaoude, A., Johnson, A., Ferguson, G., Sanches, M., Levinson, A., . . . Voineskos, A. (2016). Enhancing Self-Efficacy for Help-Seeking Among Transition-Aged Youth in Postsecondary Settings With Mental Health and/or Substance Use Concerns, Using Crowd-Sourced Online and Mobile Technologies: The Thought Spot Protocol. *JMIR Res Protoc*, *5*(4), e201. https://doi.org/10.2196/resprot.6446

Wiljer, D., Shi, J., Lo, B., Sanches, M., Hollenberg, E., Johnson, A., . . . Voineskos, A. (2020). Effects of a Mobile and Web App (Thought Spot) on Mental Health Help-Seeking Among College and University Students: Randomized Controlled Trial. *J Med Internet Res*, *22*(10), e20790. https://doi.org/10.2196/20790

Wims, E., Titov, N., Andrews, G., & Choi, I. (2010). Clinician-assisted Internet-based treatment is effective for panic: A randomized controlled trial. *Aust N Z J Psychiatry*, *44*(7), 599-607. https://doi.org/10.3109/00048671003614171

Wootton, B. M., Hunn, A., Moody, A., Lusk, B. R., Ranson, V. A., & Felmingham, K. L. (2018). Accelerated Outpatient Individual Cognitive Behavioural Therapy for Social Anxiety Disorder: A Preliminary Pilot Study. *Behav Cogn Psychother*, *46*(6), 690-705. https://doi.org/10.1017/s1352465818000267

Wright, J. H., & Mishkind, M. (2020). Computer-Assisted CBT and Mobile Apps for Depression: Assessment and Integration Into Clinical Care. *Focus (Am Psychiatr Publ)*, *18*(2), 162-168. https://doi.org/10.1176/appi.focus.20190044

Wright, J. H., Mishkind, M., Eells, T. D., & Chan, S. R. (2019). Computer-Assisted Cognitive-Behavior Therapy and Mobile Apps for Depression and Anxiety. *Curr Psychiatry Rep*, *21*(7), 62. https://doi.org/10.1007/s11920-019-1031-2