Evidence check

Digital mental health interventions for young people

27 March 2024

Evidence check questions

Q1) For young people aged 12-25 years with severe and complex mental illness, which supported online mental health treatments (delivered in partnership with, or alongside specialist community mental health care):

a) have been shown to be most effective in delivering positive mental health outcomes?

b) have been shown to be most cost-effective?

Q2) For young people aged 12-25 years with severe and complex mental illness, which online social therapies (delivered in partnership with, or alongside specialist community mental health care) have been shown to be most effective (or promising) in delivering positive social and mental health outcomes?

Summary

- Digital mental health interventions (DMHIs) for young people are an emerging area. Studies generally comprise small sample sizes, include participants with a mix of mental health severity and use self-reported symptoms or clinician-rated and diagnosed conditions.
- For less severe mental health conditions or self-reported elevated symptoms, there is evidence to support the effectiveness of DMHIs in improving symptoms. Especially internet-delivered cognitive behavioural therapies (iCBT) when delivered in-person or via virtual coaching including follow-up.
- For online social therapies, evidence mainly comprises of pilot studies with descriptive or qualitative analysis of acceptability, safety and preliminary effect compared to pre-interventions without a control group. Only one randomised controlled trial (RCT) study of an online social therapy specifically targeting young people with first-episode psychosis can be retrieved. The findings suggest effectiveness in improving vocational or educational attainment, reducing emergency visits and overall cost-savings when used alongside treatment as usual.[1, 2] However, the intervention did not demonstrate a significant benefit in improving social functioning.[1]
- Two small-scale RCT studies reported cost-savings associated with therapist-guided iCBT for children diagnosed with anxiety disorders.[3, 4] In adult populations with more research evidence, digital interventions are found likely to be cost-effective compared to no intervention or non-therapeutic controls.[5-8]

Q1a) Online mental health treatments

Systematic reviews

- Seventeen systematic reviews published since 2018 on DMHIs involving young people aged 12-25 years were included. Most studies within the systematic reviews were about the treatment of anxiety and/or depression. The most common intervention evaluated was iCBT. Other mediums for delivery of DMHIs included smartphone and mobile applications, virtual reality environments and video games.
- Many of the systematic reviews included interventions that are targeted towards a wide spectrum of severity of conditions and reported on a pooled effectiveness analysis. Therefore, there is uncertainty and a low level of confidence as to the generalisability of the findings to severe mental health conditions as a stand-alone group.
- Most systematic reviews with efficacy and effectiveness analysis reported that DMHIs for young people are effective in improving depression, anxiety and stress symptoms when compared to non-active control (receiving no therapy or being on the waitlist).[9-14] When compared to active controls (receiving some type of therapy), most systematic reviews found that the DMHIs were non-inferior (i.e. achieved similar outcomes) to controls including in-person CBT for depression and/or anxiety.[9-14]
- Some systematic reviews provided specific analysis for diagnosed (clinical) mental health disorders or interventions delivered in clinical settings. In these reviews, DMHIs were associated with mostly favourable or non-inferior outcomes for symptom improvements for depression and/or anxiety compared to control groups.[10, 15, 16]
    - DMHIs involving participants with diagnosed disorders resulted in larger favourable effect sizes than those involving elevated symptoms of depression and anxiety.[11]
    - Favourable remission outcomes (significantly higher rates of remission) were achieved for iCBT for diagnosed paediatric anxiety disorders compared to the control groups (either waitlist, treatment as usual or psychological placebo).[17] Clinician-rated functioning was significantly better than controls; however, youth-reported symptom improvement was not significantly better.[17] This review also found that lower pre-treatment anxiety severity was associated with a higher remission rate.[17]
- Two systematic reviews reported no effect of DMHIs on quality of life.[10, 16]
- For anorexia nervosa, one systematic review concluded that the use of virtual reality environments can be effective in improving eating disorder symptoms as well as lowering body-related attentional bias toward weight-related body parts and higher BMI.[18]
- For paediatric obsessive-compulsive disorder, iCBT was associated with a significant decrease in symptom scores post-treatment compared to pre-treatment or waitlist control.[19]
- For symptoms such as substance use disorder, post-traumatic symptoms, stress, aggression as well as anxiety and depression, digital gaming interventions were associated with positive outcomes including in youth residential settings.[20]
- Factors associated with effectiveness or larger effect sizes included:
    - Human therapeutic guidance, supervision and follow-up monitoring in addition to self-help or self-administered interventions[9-12, 14, 15, 17]
    - Engagement from parents or peers[9]

  - Higher completion rates[17]
  - Recruitment from clinics.[17]
- Acceptability of DMHIs by young people, parents and healthcare providers was generally high as reported in two systematic reviews.[19, 21] Factors associated with perceived usefulness, acceptability and adherence included:
  - In-person element (i.e. therapist, parent and peer) [9]
  - Privacy, anonymity and safety[9, 22]
  - Site moderation by professionals[9]
  - Interactive design, visual appeal or game-like feel[9, 14, 22-24]
  - Personalisation and customisablity[22, 23]
  - Easy to understand language and limited text or less reliance on reading or writing skills[9, 23, 24]
  - Relatable situations, characters or avatars[14, 24]
  - Ability to make quality social connections[22, 23, 25]
  - Flexibility in access and control own terms and pace[9, 22]
  - Options to receive text message reminders.[23]
- There is a lack of high quality research evaluating the effectiveness of DMHIs for socioeconomically and digitally marginalised youth who are less likely to seek professional help; [26] or examining the use of a mobile app-based platform for intervention.[27]

RCTs involving participants with clinically diagnosed conditions and/or with moderate to severe symptoms

- **Depression and anxiety** (comorbid) there is evidence of benefit (symptom improvement) with iCBT for young people with moderate to severe symptoms, regardless of being clinician-guided (regular clinician-initiated contact) or self-guided (clinician contact was initiated when there is a deterioration in mental health) and in both the routine and research settings.[28-30]
  - Clinician-guided interventions led to a larger improvement than the self-guided iCBT. [30]
  - Participant satisfaction was moderate to high.[28, 31]
  - The remission rates were higher in the intervention group compared to the waitlist control.[29]
  - In one feasibility RCT, clinician-guided online emotion regulation training in addition to in-person CBT has led to a significant reduction in anxiety and depressive symptoms and improved emotion regulation.[32]
- **Depression** studies mainly targeted major depressive disorders and demonstrated evidence of the benefit of internet-delivered behavioural activation therapies,[33] CBT,[34, 35] psychodynamic therapy,[34, 36] or mindfulness-based CBT,[37] in reducing the symptom severity and increasing the remission rate compared to treatment as usual, supported control or pre-intervention. All interventions were therapist-guided or had either in-person or virtual coaching elements.
- **Anxiety** studies mainly targeted paediatric anxiety disorders and demonstrated evidence of the benefit of iCBT for improving symptom severity compared to pre-treatment, waitlist control or active control (supportive play or therapy).[3, 4, 38]

  - In one study, the remission rate was higher in the intervention group than the control group which received an active online supportive therapy.[3]
  - The addition of a mobile application adjunct to augment cognitive-behavioural group therapy for adolescents with social anxiety did not demonstrate additional benefits in a small feasibility RCT.[39]
- **Obsessive-compulsive disorder** one RCT study evaluated the effectiveness of iCBT implemented in a stepped-care model compared to in-person CBT. The findings demonstrated that iCBT followed up by in-person CBT as necessary can lead to non-inferior results in symptom improvement at six-month follow-up.[40]

Q1b) Cost-effectiveness

- Two RCT studies evaluated the cost-effectiveness of the therapist-guided iCBT for children diagnosed with anxiety disorders and both reported cost savings compared to online child-directed play or other online supportive therapy only.[3, 4]
- A supplementary search was conducted to broaden the criteria to include adult populations.
  - Overall, digital interventions are likely to be cost-effective compared to no intervention or non-therapeutic controls. There is conflicting evidence when compared with usual care or therapeutic intervention, with two review articles suggesting more cost-effective, one suggesting a lower net monetary benefit and another saying this is unclear.[5-8]
  - Studies were often not directly comparable as they used different methods, different comparison groups and there is considerable uncertainty in estimated treatment effects.[5, 7]
  - Digital interventions that were supported by a clinician, an assistant or a layperson had higher delivery costs than patient-self-directed interventions but yielded a greater net monetary benefit if the opportunity cost was above £3000 per quality-adjusted life-year (QALY).[7]
  - One study included both adults, children and adolescents but found that it was inconclusive whether the intervention was cost-effective in children and adolescents.[8]

Q2) Social therapies

- No studies were found to meet the inclusion criteria. A supplementary search was conducted to remove the systematic review filter and capture individual studies.
- Most online social therapies are made up of multiple components including online therapy or psychoeducation, peer-peer networking, expert support or clinician delivered web chat counselling.
- Overall, social therapies for young people and carers were found to:
  - Be effective in improving vocational or educational attainment, subjective wellbeing, reduced use of hospital emergency services, psychological distress, depression, loneliness, social support, autonomy, self-competence and cost[1, 41-43]
  - Mixed results on social function and perceived stress[1, 41, 42]
  - Have no effect on emotional awareness.[43-45]
- Generally, these therapies were found to be safe to use, well perceived by users with no serious adverse events.

- One study on carers of young people found that carer burden, stress, expressed emotion, family communication, quality of life, functioning, coping and perceived knowledge of borderline personality disorder were improved at three months compared with baseline.[46]

Individual therapies are summarised by condition below.

Psychosis

- Three social therapies: *Horyzons* (interactive online therapy, peer-peer online social networking, peer moderation and expert support), *Altitude* (psychoeducation, peer-to-peer social networking, and expert and peer web-based moderation for family carers) and *Momentum* (strengths and mindfulness-based intervention and application of the self-determination theory of motivation) were identified for people with first-episode or at risk of psychosis.[2, 42, 43, 47, 48]
  - Horyzons did not find a significant effect on social functioning compared with treatment as usual. However the intervention was effective in improving vocational or educational attainment, and reduced usage of hospital emergency services and lower costs.[1]
  - Altitudes saw no treatment effect in perceived stress compared with treatment as usual. However there were significantly fewer visits to emergency departments in the intervention group.[48]
  - Momentum saw improvements in social functioning and subjective wellbeing at two month follow up compared to baseline.[42]

Mental ill-health

- Enhanced Moderated Online Social Therapy (MOST+) is a therapy which combines real-time, clinician-delivered web chat counselling, user-directed online therapy, expert and peer moderation and peer-to-peer social networking.[41]
- Majority of people reported MOST+ helped them feel better, with no serious adverse events occurring.
- There were statistically significant improvements (from baseline to follow up at nine weeks) in 8 of 11 secondary outcomes including psychological distress, perceived stress, psychological well-being, depression, loneliness, social support, autonomy, and self-competence.[41]

Emerging mental health problems

- ENYOY is the Dutch version of the original Moderated Online Social Therapy Platform (MOST+) from Australia.
- ENYOY had high usability and positive user experiences. There were different or no individual effects on perceived stress and emotional awareness.[44, 45]

Borderline personality disorder

- Kindred is an online intervention for carers of young people which incorporates online psychoeducation, carer-to-carer social networking and guidance from expert and peer moderators.
- The intervention was acceptable, usable and safe. Carer burden, stress, expressed emotion, family communication, quality of life, functioning, coping and perceived knowledge of borderline personality disorder were improved at three months compared with baseline.[46]

Suicidal ideation

- Affinity is a closed website with three key components: therapeutic content delivered via comics, peer-to-peer social networking, and moderation by peers and clinicians.
- Interviews with young people identified four themes: a safe and supportive environment, the importance of mutual experiences, difficulty engaging and connecting, and the pros and cons of banning discussions about suicide.[49]

Grey literature

- A 2022 literature review of effectiveness of supported DMHIs, conducted by the University of Melbourne and commissioned by the Australian Government Department of Health, concluded that DMHIs are effective in treating a wide range of disorders, including depression, anxiety and binge eating. It further concluded that supported DMHIs are low cost and cost effective. For youth, based on two published systematic reviews, it concluded favourable and small to moderate effect of supported DMHIs for treating depression and anxiety.[50]
- In February 2023, the National Institute for Health and Care Excellence (NICE) in the United Kingdom recommended four guided self-help digital CBT technologies for children and young people (aged 5-18) with mild to moderate symptoms of anxiety and low mood as an initial treatment.[51] The recommendations were based on early value assessment including evidence analysis and expert and patient consultations. The treatments recommended included:
    - Lumi Nova (BfB labs)
    - Online Social anxiety Cognitive therapy for Adolescents (OSCA)
    - Online Support and Intervention for child anxiety (OSI)
    - Space from anxiety for teens, space from low mood for teens, space from low mood and anxiety for teens (Silvercloud).[51]
- In other reports that are not specific to young people, DMHIs in general are found to be effective and beneficial in not only improving treatment outcomes, but also in improving access especially for underserved populations, reducing stigma and offering good value for money.[52-54]

Limitations

Some systematic reviews include a combination of adults and young people and where most of the participants were adults (i.e. over 50%), these reviews were excluded. For social therapies, the search terms were limited to ‘social therapies’, and while similar articles were searched on PubMed, there is risk other jurisdictions use different terminology that wouldn’t have been picked up in this search. This is a rapid evidence check that has not been developed and/or reviewed with the involvement of people with a lived experience of mental health issues.

Background

Supporting mental health is a key objective of the NSW Future Health strategy, particularly Strategic Outcome 5 Research and innovation, and digital advances inform service delivery.[55]

The Australian Commission on Safety and Quality in Health Care (the Commission) has developed the National Safety and Quality Digital Mental Health (NSQDMH) Standards which aim to improve the quality of digital mental health service provision, and to protect service users and their support people from harm.[56]

The Australian Government Mental Health Productivity Commission Inquiry Report also recommends that online treatment should be expanded to provide a convenient, clinically effective, low-cost way to manage mental illness. It should be an option that is available to people as a choice, while recognising that some people will prefer face-to-face care or a combination of options.[57]

Methods (Appendix 1)

PubMed and Google searches were conducted on 26 September 2023. See Appendix 1 for search strategy and inclusion criteria.

Peer reviewed evidence

Table 1: Digital mental health interventions – systematic reviews

Note some of the information has been copied directly from the source material.

Source	Study description	Key outcomes (effectiveness, feasibility, acceptability, etc.)
Evidence on Digital Mental Health Interventions for Adolescents and Young People: Systematic Overview Lehtimarki, et al. 2021	• 18 systematic reviews and meta-analyses were included. • Most systematic reviews and meta-analyses reported findings across studies that test the effectiveness of the implementation of computerised cognitive behavioural therapy (cCBT). • Most systematic reviews and meta-analyses included in this review focused on anxiety (n=4), depression (n=3), anxiety and depression together (n=11), or anxiety and depression with stress (n=3). • Intervention digital platforms included video games, mobile apps, eHealth, Computer-delivered or web-based interventions.	• For anxiety and depression, compared to non-active controls, there is evidence of benefit. • For anxiety and depression, compared to active controls, defined as those undergoing or receiving some type of treatment, digital interventions appear to be similarly effective. • Interventions with an in-person element with a professional, peer, or parent were associated with greater effectiveness, adherence and lower dropout than fully automatized or self-administered interventions.
Efficacy of internet-based cognitive-behavioral therapy for depression in	• 18 RCTs were included.	• Compared to control groups, like attention control, waiting list and treatment as usual, the iCBT led to:

Source	Study description	Key outcomes (effectiveness, feasibility, acceptability, etc.)
adolescents: A systematic review and meta-analysis Wu, et al. 2023	• Studies were conducted in schools (33.33%), communities (27.78%), and clinics (38.89%). • 88.90% were distributed in high-income countries, 5.55% from upper-middle-income countries and 5.55% from lower-middle-income countries.	○ a significant reduction in depression scores ○ a significant reduction in anxiety scores ○ no difference in quality-of-life scores. • In studies that were conducted in clinical setting and the outcomes or scores were rated by clinicians and compared to controls, the iCBT was associated with a significant reduction in depression scores.
Internet- and Mobile-Based Interventions for Mental and Somatic Conditions in Children and Adolescents Domhardt, et al. 2018	• Eight meta-analyses were included. • Target diagnoses were depression, anxiety, chronic pain or unspecified health conditions. • Intervention elements included: ○ delivered via computer, internet, or mobile applications based on CBT principles ○ dynamic gaming-type interventions ○ virtual reality environments ○ online-based and conventional psychosocial interventions.	• Compared to predominantly non-active control conditions (waiting-list; placebo), there is evidence that the internet- and mobile-based interventions are efficacious (although not statistically significant) for the following conditions: ○ depression (range of standardised mean differences, (SMDs) = 0.16 to 0.76; 95% CI: -0.12 to 1.12) ○ anxiety (SMDs = 0.30 to 1.4; 95% CI: -0.53 to 2.44) ○ chronic pain (SMD = 0.41; 95% CI: .07 to .74)
Internet-Delivered Interventions for Depression and Anxiety	• 23 studies were included.	• Compared to the control groups, the internet-delivered interventions had:

Source	Study description	Key outcomes (effectiveness, feasibility, acceptability, etc.)

Symptoms in Children and Young People: Systematic Review and Meta-analysis
 	
Eilert, et al. 2022
	• Most of these interventions were delivered to children and young people. Some interventions were also delivered to the parents.
	• The RCTs included participants with at least mild to moderate symptoms or those who met the diagnostic criteria for a primary disorder of anxiety or depression assessed via structured clinical interviews or self-report measures.
	• Active treatment interventions included:
	  ○ iCBT
	  ○ internet-delivered cognitive or attentional bias modification interventions
	  ○ problem-solving therapy
	  ○ affect-focused psychodynamic therapy
	  ○ spirituality-informed intervention.
	• Most studies provided some form of regular scheduled feedback or assistance from a therapist, psychologist, or mental health professional.
		○ significant small favourable effect for anxiety symptoms
		○ a small but not significant favourable effect for depression
		○ a small significant effect for impaired functioning
		○ no effect on quality of life.

Technology Delivered Interventions for Depression and Anxiety in Children and Adolescents:	• 34 RCTs were included. • Studies were included if the sample were assessed to have a diagnosed anxiety or depression disorder	• Compared to waitlist control, there was a small effect in favour of computer and internet delivered interventions on depression and anxiety outcomes.

Source	Study description	Key outcomes (effectiveness, feasibility, acceptability, etc.)

A Systematic Review and Meta-analysis
 	
Grist, et al. 2019
	or had elevated symptoms which were of mild to moderate severity.
	• The trials evaluated:
	  ○ computerised and internet CBT
	  ○ computer-delivered attention bias modification programs
	  ○ cognitive bias modification programs
	  ○ others.
	• Over half of the interventions (n = 18) involved participants with a confirmed diagnosis of depression or anxiety with the remainder (n = 16) including participants with elevated symptoms of depression or anxiety.
		• Control condition affected the effect size of the interventions.
		  ○ Technology-based interventions did not produce statistically significant benefits over face-to-face CBT interventions or other therapy control conditions.
		  ○ Technology-based interventions produced a small effect size demonstrating benefit over attention and placebo controls.
		  ○ Technology-based interventions produced a medium effect size demonstrating benefit compared to wait-list controls.
		• Problem severity moderated the effect size of the interventions.
		  ○ Interventions that involved participants with diagnosed disorders had larger effect sizes compared to interventions that involved participants with elevated symptoms of depression or anxiety.
		• Therapist support also moderated the effect size of the interventions.
		  ○ Minimal contact therapy produced larger effect sizes than predominantly self-help and purely self-administered interventions.

Source	Study description	Key outcomes (effectiveness, feasibility, acceptability, etc.)

Internet and Computer-Based Cognitive Behavioral Therapy for Anxiety and Depression in Adolescents and Young Adults: Systematic Review and Meta-Analysis
 	
Christ, et al. 2020
	• 24 studies were included
	• Studies targeted participants with a diagnosis or elevated symptoms of depressive disorder, anxiety disorder or both.
	• Most interventions were completed at the respondent's home, and the rest were at schools or the treatment site.
	• In 14 studies, participants were guided through the intervention by a therapist or researcher.
		• Compared with passive controls (i.e. waiting list, no treatment or information control), cCBT yielded:
		  ○ small to medium post-treatment pooled effect sizes regarding depressive symptoms
		  ○ small to medium post-treatment pooled effect sizes regarding anxiety symptoms.
		• Compared to active controls (i.e. face-to-face CBT or treatment as usual), cCBT yielded:
		  ○ similar post-treatment pooled effect sizes regarding anxiety symptoms
		  ○ similar (non-significant) yet less favourable post-treatment pooled effect sizes regarding depression symptoms.
		• Intervention effect sizes regarding depressive and anxiety symptoms were larger in the therapist-guided interventions than in the self-guided interventions.
		• There is no significant effect of interventions involving participants recruited through clinical settings.

Computerized Cognitive Behavioral Therapy for Treatment of Depression and Anxiety in Adolescents:	• 16 RCTs were included. • Studies had a range of participant exclusion criteria, most often excluding participants who had	• Small but statistically significant effects of cCBT were detected, with cCBT conditions showing lower symptom scores at follow up, compared with control conditions for both anxiety (standardized mean difference −0.21, 95% CI

Source	Study description	Key outcomes (effectiveness, feasibility, acceptability, etc.)
Systematic Review and Meta-analysis Wickersham, et al. 2022	severe symptoms, had other disorders, were at high risk of self-harm or suicide or were already receiving treatment. • Interventions were conducted at school, at the participant's home or in a setting of the participant's choice, such as a local child and adolescent mental health service, local general practice or community centre. • The extent of clinician or therapist input varied among interventions but was typically minimal. • Most interventions did not require parents to take an active role.	−0.33 to −0.09; I2=36.2%) and depression (standardised mean difference −0.23, 95% CI −0.39 to −0.07; I2=59.5%).

What Works and What Doesn't Work? A Systematic Review of Digital Mental Health Interventions for Depression and Anxiety in Young People
 	
Garrido, et al. 2019
	• 41 studies were included.
	• Most of the DMHIs drew on established therapeutic models, primarily CBT (n=28) or a combination of CBT with other models.
		• Compared to no-intervention control:
		  ○ small favourable effect on depression
		  ○ pooled effect sizes were higher when supervision was involved.
		• There was no significant effect compared to other active control.
		• Qualitative analysis revealed that users liked interventions with a game-like feel and relatable, interactive content.

Source	Study description	Key outcomes (effectiveness, feasibility, acceptability, etc.)
Digitally-delivered cognitive-behavioural therapy for youth insomnia: A systematic review Werner-Seidler, et al. 2018	• Three studies were included and two used the same intervention. • Participants in the included studies included adolescents with insomnia symptoms and a college sample of individuals who opted into a stress-management study. • The interventions tested in all three studies were delivered using an online system over six weeks. • Support from therapists, manual reminders and alerts were provided.	Compared to baseline or waitlist controls, the interventions were associated with significant improvements in: • sleep efficiency • sleep quality • sleep-onset latency • total sleep time.
Technology-delivered cognitive-behavioral therapy for pediatric anxiety disorders: a meta-analysis of remission, posttreatment anxiety, and functioning Cervin, et al. 2021	• Nine RCTs were included. • Included paediatric anxiety disorders that included participants <18 years of age with a confirmed primary anxiety disorder according to a structured diagnostic interview. • Assessed the efficacy of technology-delivered CBT. • All included caregiver involvement but to varying degrees. • Three studies included face-to-face sessions.	• Compared to the control groups (either waitlist, treatment as usual or psychological placebo), the technology-delivered CBT was associated with: ○ significantly higher rates of remission for primary anxiety disorders (37.9% versus 10.2%) post-treatment ○ lower pre-treatment anxiety severity, a higher proportion of completed sessions, inclusion of face-to-face sessions, clinic recruitment and a larger proportion of males were also associated with higher remission rates.

Source	Study description	Key outcomes (effectiveness, feasibility, acceptability, etc.)
		○ significantly higher rates of remission for all anxiety disorders (19.5% versus 5.3%) post-treatment ○ no statistically significant difference for youth-reported anxiety ○ statistically significant improvement in caregiver-reported anxiety at post-treatment ○ statistically significant improvements for clinician-reported functioning post-treatment.
Assessment and treatment of mental health conditions in children and adolescents: A systematic scoping review of how virtual reality environments have been used Blanco, et al. 2023	• 13 studies were included. • Use of virtual reality environments (VRE) in the treatment of childhood and/or adolescent mental health disorders. • The most common VRE hardware used across studies was Oculus Rift HMD, followed by Blue Room CAVE system. • Ten studies focused on anxiety-related disorders, with six of those focusing on specific phobias. The three other studies targeted internet gaming disorder and anorexia nervosa • The majority of the anxiety-related studies applied VREs as an exposure therapy tool, while one study	• VRE to expose adolescents with anorexia nervosa: reduced eating disorder symptoms as well as lower body-related attentional bias toward weight-related body parts and higher body-mass index. • For anxiety there was a reduction in symptoms. • Conclusion: ○ Some promise for the use of VRE assessments and interventions for childhood mental health problems, particularly for anxiety-related disorders, such as social anxiety and specific phobias. However, high-quality RCTs are now needed to establish the effectiveness of VREs in this population, and how they compare to existing evidence-based approaches, given its promise to improve both engagement and outcomes.

Source	Study description	Key outcomes (effectiveness, feasibility, acceptability, etc.)
	used VRE to engage adolescents in deep breathing practice.	
Quality Social Connection as an Active Ingredient in Digital Interventions for Young People With Depression and Anxiety: Systematic Scoping Review and Meta-analysis Dewa, et al. 2021	• 42 studies were included. • DMHI types included mental health social networking tools, smartphone apps, self-help CBT, telepsychiatry, one-to-one peer mentor support, video gaming, avatars and internet use for mental health support. Non-specific informal digital interventions included general social networking and social media (e.g. Facebook, Twitter, Tumblr, Snapchat, and Reddit) and general internet use and web browsing.	• Quality social connections within digital interventions showed a significant decrease in depression and anxiety. • Digital mechanisms helped create a quality connection included anonymity, confidentiality and peer support.

Attitudes of Children, Adolescents, and Their Parents Toward Digital Health Interventions: Scoping Review
 	
Halluin, et al. 2023
	• 30 studies were included.
	• Studies are mostly observational with qualitative methods.
	• Studies are about a wide range of mental conditions of varying degrees of severity.
		• Perceived facilitator of use included:
		  ○ easy to use, flexible, customizable and aesthetically pleasing
		  ○ autonomy of use coupled with greater freedom in care seeking.
		  ○ social connection - receiving support from other people experiencing the same type of mental health problems
		  ○ privacy and confidentiality.

Source	Study description	Key outcomes (effectiveness, feasibility, acceptability, etc.)

Gaming My Way to Recovery: A Systematic Scoping Review of Digital Game Interventions for Young People's Mental Health Treatment and Promotion
 	
Ferrari, et al. 2022
	• 49 studies testing 32 digital games were included.
	• 9 studies focused on severe and complex mental conditions:
	  ○ they included four therapeutic games for trauma, depression, anger management, relapse prevention and substance use disorder.
		• For severe and complex mental health conditions:
		  ○ significant positive associations were identified on key variables for three of the seven games:
		  ▪ abstinence from drugs
		  ▪ anxiety and externalising behaviour
		  ▪ post-traumatic symptoms and stress
		  ▪ anxiety
		  ▪ aggression
		  ▪ depression
		  ○ effectiveness was demonstrated for two games in youth residential settings
		  ○ strong acceptability and satisfaction among youth and staff.

eMental Healthcare Technologies for Anxiety and Depression in Childhood and Adolescence: Systematic Review of Studies Reporting Implementation Outcomes	• 46 studies were included.
	• Studies examined the following three types of digital technologies as part of treatment:
	  ○ internet-based technologies
	  ○ computer-based technologies
		• Acceptability of digital mental healthcare technology appears to be high.
		• Perceptions of the appropriateness of digital mental healthcare technology for use in healthcare varied, as did the adoption of technologies in healthcare practice.

Source	Study description	Key outcomes (effectiveness, feasibility, acceptability, etc.)
Wozeny, et al. 2018	○ smartphone-based (app or text message) technologies.	
Engaging Children and Young People in Digital Mental Health Interventions: Systematic Review of Modes of Delivery, Facilitators, and Barriers Liverpool, et al. 2020	• 83 articles and 71 interventions were included. • Intervention types included: ○ websites ○ games and computer-assisted programs ○ apps ○ robots and digital devices ○ virtual reality ○ mobile text messaging.	• Two themes emerged highlighting intervention-specific and person-specific barriers and facilitators to children and young people's engagement. • Children and young people prefer interventions with features such as videos, limited text, the ability to personalise, the ability to connect with others and options to receive text message reminders.
Acceptability, feasibility, and efficacy of Internet cognitive behavioral therapy (iCBT) for pediatric obsessive-compulsive disorder: a systematic review Babiano-Espinosa, et al. 2019	• Six studies were included. • Aims to investigate the acceptability, feasibility and efficacy of traditional CBT with iCBT for paediatric obsessive-compulsive disorder.	• Acceptability: moderate to high acceptability among adolescents and parents. • Feasibility: low drop-out rates across included studies (<5%). • Efficacy: ○ significant decrease in symptom scores post-treatment compared to pre-treatment ○ significant decrease in symptom scores compared to waitlist control.

Source	Study description	Key outcomes (effectiveness, feasibility, acceptability, etc.)
Qualitative Synthesis of Young People's Experiences With Technology-Assisted Cognitive Behavioral Therapy: Systematic Review McCashin, et al. 2023	• 14 studies were included • These studies represented interventions for low mood and anxiety (n=10), trauma or self-harm (n=2), and physical difficulties (n=2).	• Overall, young people's experiences with tech-assisted CBT were mostly positive. • The use of gaming environments, relatable characters, concrete metaphors, and age-appropriate narratives contributed to these positive experiences. • Clear barriers also emerged, including over-reliance on reading and writing skills and dissatisfaction with overly generalized content and comparison with commercial technologies. • In terms of helpfulness, the ability to use tech-assisted CBT (or adjuncts to tech-assisted CBT, such as apps) encouraged help-seeking behaviours among young people (5 and 12). They also expressed that the technology was easier to engage with than speaking with adults

Table 2: Digital mental health interventions – RCTs involving participants with clinically diagnosed conditions and/or with moderate to severe symptoms

Note some of the information has been copied directly from the source material.

Intervention description and features	Key outcomes (effectiveness, feasibility, acceptability, etc.)
Depression and anxiety	
Mood Mechanic Course • A transdiagnostic iCBT treatment that simultaneously targets symptoms of anxiety and depression using cognitive and behavioural skills. • The sample comprised of 96 in clinician guided treatment and 95 in self-guided treatment. • Participants mainly included those with moderate to severe symptoms of anxiety and depression. • comprised 4 to 5 lessons, delivered over 5 weeks. • Participants in routine care had access to a clinician via telephone or a secure private messaging system.[30]	Clinician-guided versus self-guided iCBT: • both the clinician-guided and self-guided iCBTs resulted in significant reductions in depression and anxiety symptoms compared to pre-intervention • the clinician-guided iCBT led to a larger improvement in symptoms than the self-guided iCBT.[30] In both the research and routine healthcare settings, this intervention was associated with: • significant symptom reductions post-treatment • low deterioration rate • high level of treatment satisfaction.
Chilled Plus Program (CP) • iCBT • Eight online modules, each supported by a 30-minute therapist telephone consultation with the adolescent. • Inclusion criteria were: age between 12 and 17 years, met criteria for both an anxiety and depressive disorder, as well as willingness to be randomised to one of the two conditions.	Compared to the waitlist control, the treated participants had: • significant reduction in the total number of disorders • higher proportion of remission (43.8% versus 20.9%) • significant reduction in anxiety and depressive symptoms overtime.[29]

Intervention description and features	Key outcomes (effectiveness, feasibility, acceptability, etc.)
• The sample comprised of 45 in the active treatment group and 46 in the waitlist control. • Parents participated in a brief portion of the consultation with the therapist. • Participants had complex and diagnosed anxiety and depression.[29]	
youthCOACHCD • iCBT. • Consists of an introductory session and seven modules. • Participants were coached by one of two coaches who were graduates of a Master's Degree in Psychology and provided semi-standardised, asynchronous feedback after each completed module. • Participants were advised to keep a daily mood diary, which was offered on a mobile app. • The sample consisted of 15 in intervention and 15 in control. • Almost all participants reported having been treated by a general practitioner or paediatrician and a disease-specific physician during the 9-month reporting period. • 50% showed symptoms of anxiety and/ or depression above a cut-off score of Patient Health Questionnaire (PHQ-9) or General Anxiety Disorder-7 (GAD-7) ≥7.[31]	Compared to the waitlist control group, the treatment group had non-significant but favourable changes in symptoms of anxiety and depression twelve weeks post-randomisation for all participants. The intervention satisfaction and perceived therapeutic alliance were moderate compared to other iCBTs.
CBT + ERT delivered via Therapieland • Internet-based emotion regulation training added to CBT.	• Adherence to emotion regulation training was 66.5 %. • Treatment satisfaction was adequate.

Intervention description and features	Key outcomes (effectiveness, feasibility, acceptability, etc.)
• The sample consisted of 21 in intervention and 18 in control. • Consisted of six online sessions and two appointments with the emotion regulation training therapist. • After each online session, the psychologist provided feedback using a secured email within the online platform.[32]	• Significantly reduced anxiety symptoms, depressive symptoms, and maladaptive emotion regulation, and enhanced adaptive emotion regulation at six months follow-up in the CBT and emotion regulation training group compared to controls.
Depression	
Affect-focused internet-based psychodynamic therapy (IPDT) • Participants consisted of those fulfilling the criteria for major depressive disorder. • 38 in intervention and 38 in supportive control. • The intervention consisted of eight therapist-supported self-help modules delivered over eight weeks on a secure online platform. • Modules consisted of texts and videos, followed by exercises that participants completed and sent to their therapist, for which they received feedback, typically within 24 hours on working days. • The control condition consisted of supportive contact over the internet with weekly monitoring of symptoms and well-being.[36]	• IPDT was significantly more effective than the control condition in reducing depression and anxiety and increasing emotion regulation and self-compassion. • Significantly more patients in the IPDT group compared to the control group met the criteria for response and remission (35% vs 8%, respectively).
Therapist-guided and self-guided internet-delivered behavioural activation (I-BA) • The sample consisted of 11 in therapist-guided intervention, 10 in self-guided intervention and 11 in treatment as usual. • Participants had a diagnosis of mild or moderate major depressive disorder.	• No serious adverse events were recorded. • Satisfaction was acceptable in both I-BA groups. • Both therapist-guided and self-guided I-BA, but not treatment as usual, showed statistically significant changes in the symptom severity with large within-group effect sizes.

Intervention description and features	Key outcomes (effectiveness, feasibility, acceptability, etc.)
• Two I-BA treatments were delivered through a secure online platform, each consisting of eight chapters with age-appropriate texts, animations, films and various exercises delivered over 10 weeks. • A mobile application provided support for the homework for both adolescents and parents after each chapter. • In the therapist-guided I-BA arm, the participants had weekly asynchronous contact with a clinical psychologist via written messages within the platform. • Both conditions of I-BA in this study included a parallel eight-chapter course for parents.[33]	
Internet-based psychodynamic therapy • Participants consisted of adolescents with major depressive disorder. • The sample consisted of 136 in IPDT and 136 in the iCBT group. • Both the IPDT and the iCBT consisted of eight self-help modules delivered over 10 weeks. • Both treatments were therapist-guided.[34]	Compared to iCBT there was: • a higher proportion of remission (40% versus 38%) • no significant different in treatment effect on symptom improvement.
Mind Your Total Health (MYTH) - for adolescent or young adult cancer survivors' depression • Coach-assisted online CBT • Eight weekly 30-35 minutes coach-assisted. • The sample consisted of 10 in intervention and 10 in active control (BeatingtheBlues) intervention.[35]	• The completion rate was high in the intervention group (80%). • Compared to pre-intervention, the MYTH led to a significant reduction in depression and anxiety severity. • Compared to the control group, the MYTH led to a significant reduction in depression severity.

Intervention description and features	Key outcomes (effectiveness, feasibility, acceptability, etc.)
Online Mindfulness-Based Cognitive Behavioural Therapy Intervention • Online mindfulness-based cognitive behavioural therapy (CBT-M) was combined with standard psychiatric care. • Participants were diagnosed with major depressive disorder. • The sample consisted of 22 in CBT-M and standard care and 23 in standard psychiatric care alone. • Navigation coaching delivered by phone and secure text messaging.[37]	Compared to standard care, the CBT-M was associated with significant reduction in symptom severity.
Anxiety	
Therapist-guided internet cognitive behavioural therapy • Participants were children aged 8-12 years with a diagnosis of a principal anxiety disorder (separation anxiety disorder, generalised anxiety disorder, specific phobia, social anxiety disorder, or panic disorder) of at least moderate severity. • The sample consisted of 66 in iCBT and 65 in child-directed play. • The intervention group received iCBT and the control group received internet-based child-directed play. • Both treatment programs comprised 12 modules presented over 12 weeks with weekly asynchronous online therapist support. They consisted of texts, films, illustrations and exercises.[4]	• Both groups experienced significant improvements in the principal anxiety symptoms. • Greater improvement was seen with iCBT than with the active control. • iCBT resulted in an average societal-cost saving of €493·05 per participant.
Wiring Adolescents with Social Anxiety via Behavioral Interventions (WASABI)	Compared to digital cognitive-behavioural group therapy delivered via video calls alone, the addition of WASABI was associated with:

Intervention description and features	Key outcomes (effectiveness, feasibility, acceptability, etc.)
• A clinician-assisted application that uses ecological momentary assessments, cognitive bias tests and clinical self-reports • Delivered in addition to cognitive-behavioural group therapy.	• not statistically significant, yet better improvement in symptom severity, social skills and functioning • effect sizes were greater for digital cognitive-behavioural group therapy plus WASABI on symptom severity, social skills, and functioning.[39]
Online Social anxiety Cognitive therapy for Adolescents (OSCA) • OSCA takes 14 weeks. All users receive a set of eight core modules. • 22 in OSCA and 21 in the waitlist. • Up to 16 additional modules focusing on particular fears or problems can be released to individualise the program for each user. • During the 14 weeks, young people allocated to OSCA have weekly 20-minute phone calls with their therapist and they also receive regular encouragement and support via secure messaging within the program and SMS texts.[38]	Compared to the waitlist control, OSCA was associated with: • significant improvement in symptom severity • large effects that were maintained at six-month follow up. • significant improvement in parent-reported internalising symptoms and impairment.
Therapist-guided iCBT • Children and adolescents, 10 to 17 years of age, with a principal diagnosis of seasonal affective disorder and their parents were included in the study. • 51 in iCBT and 52 in internet-delivered supportive therapy. • Active comparator group received internet-delivered supportive therapy. • iCBT and internet-delivered supportive therapy, both including 10 online modules, 5 separate parental modules, and 3 video call sessions with a therapist.[3]	• Compared to internet-delivered supportive therapy, iCBT was associated with significant reduction in the severity of symptoms. • The observed proportion of seasonal affective disorder-free participants was larger in the iCBT group than in the internet-delivered supportive therapy group at the three-month follow up (30.6% vs 18.0%) • The cost-effectiveness analyses indicated cost savings associated with iCBT compared with internet-delivered supportive therapy, with the main drivers of the savings being lower medication costs and increased school productivity in the iCBT group.

Intervention description and features	Key outcomes (effectiveness, feasibility, acceptability, etc.)
Obsessive compulsive disorder	
iCBT implemented in a stepped-care model • Participants were children and adolescents with obsessive-compulsive disorder. • 72 in iCBT and 78 in control (in-person CBT). • Participants in the intervention group received in-person CBT if necessary, after the completion.[40]	Compared to in-person CBT, the iCBT stepped-care model was associated with: • at three months follow up, higher rates of non-responders (46% versus 30%) • at the six-month follow up, non-inferior results for symptom severity.

Table 3: Cost-effectiveness

Note some of the information has been copied directly from the source material.

Source	Methods, description and features	Key outcomes (cost, efficiency)
Cost-effectiveness of Internet Interventions Compared With Treatment as Usual for People With Mental Disorders: Systematic Review and Meta-analysis of Randomized Controlled Trials Rohrbach, et al. 2023	Systematic review of RCTs with economic analysis (comparing internet interventions with treatment as usual). 37 studies with 14,946 participants were included.	• Internet interventions were slightly more effective than usual care in terms of quality-adjusted life years gain and equally expensive. The pooled incremental net benefit was US$255, favouring internet interventions over usual care.
Digital interventions in mental health: evidence	Four work packages were completed:	1. Included studies are not directly comparable because of different methods used, however the overall picture

Source	Methods, description and features	Key outcomes (cost, efficiency)
syntheses and economic modelling Gega, et al. 2022	1. a systematic review and quality assessment of economic studies about digital interventions 2. a systematic review and network meta-analysis of RCTs on digital interventions for generalised anxiety disorder 3. an economic model and value-of-information analysis on digital interventions for generalised anxiety disorder 4. a series of knowledge exchange face-to-face and digital seminars with stakeholders.	suggests that digital interventions are likely to be cost-effective, compared with no intervention and non-therapeutic controls. The value of digital interventions compared with face-to-face therapy or printed manuals is unclear. 2. Results were used to inform the economic model. When considered on their own they were inconclusive. 3. Decision-analytic model found digital interventions were associated with lower net monetary benefit than medication and face-to-face therapy, but greater net monetary benefit than non-therapeutic controls and no intervention. Value for money was driven by clinical outcomes rather than by intervention costs. Uncertainty in the treatment effect had the greatest value. 4. Several areas of benefits and costs of digital interventions were identified including safety, sustainability and reducing waiting times.
Cost Effectiveness of Digital Interventions for Generalised Anxiety Disorder: A Model-Based Analysis Jankovic, et al. 2022	An open-source decision analytic cohort model was used.	• Digital interventions were associated with lower net monetary benefit compared with medication and with group therapy, but greater net monetary benefit compared with non-therapeutic controls and usual care. • Digital interventions that were supported by a clinician, an assistant or a lay person had higher delivery costs than patient-self-directed interventions. This yielded a greater net monetary benefit when opportunity cost was above £3000/quality-adjusted life year. • Considerable uncertainty in estimated treatment effects.

Source	Methods, description and features	Key outcomes (cost, efficiency)
Economic Evaluation of Cognitive Behavioral Therapy for Depression: A Systematic Review Li, et al. 2022	Systematic review of 38 studies comparing internet-based and face-to-face CBT.	• ICBT (guided or unguided) has a significant cost-effectiveness advantage (incremental cost-effectiveness ratio -$37 717.52/quality-adjusted life year to $73 841.34/quality-adjusted life year, time horizon 3-36 months). • The evidence for the cost-effectiveness of CBT related therapy for children and adolescents was ambiguous. • There were differences in study designs and settings.

Table 4: Online social therapies

Note some of the information has been copied directly from the source material.

Intervention description	Key outcomes (cost, efficiency)
Psychosis	
Horyzons is a novel online social therapy to support young people aged 16-27 years following discharge from first-episode psychosis services.[2] The therapy is based on the moderated online social therapy model which integrates interactive online therapy, peer-peer online social networking, peer moderation and expert support by mental health clinicians and vocational workers. Horyzons is powered by MOST, is an online mental health support platform for young people.[47]	• An RCT did not find a significant effect on social functioning compared with treatment as usual, however the intervention was effective in improving vocational or educational attainment, and reduced usage of hospital emergency services.[1] • Total costs were significantly lower in the Horyzons intervention group compared with treatment as usual, from both the healthcare sector and societal perspective.[2] • Qualitative interviews with users of the Horyzons platform found that people used online therapy for on-demand support to deal with distress, to distract themselves from distress in a positive way. Some people valued the flexibility whilst others felt overwhelmed with the amount of choice.[58]

Altitudes is a digital moderated online social therapy for carers of first-episode psychosis young people. The therapy includes integrated within one web-based application: evidence-based psychoeducation, peer-to-peer social networking, and expert and peer web-based moderation. Altitudes is powered by MOST.[43, 48]	• Two cluster RCTs found that for carers there was no treatment effect in perceived stress compared with treatment as usual alone.[43] • Both the intervention and treatment as usual groups improved on stress over time. There were significantly fewer visits to emergency departments in the intervention group.[48]
Momentum is an intervention targeting social functioning in young people at ultra-high risk of psychosis. Momentum blends two approaches: a strengths and mindfulness-based intervention within a social media environment and application of the self-determination theory of motivation.[42]	• A pilot study found the intervention was considered safe and would be recommended to others. • There were improvements in social functioning and subjective wellbeing at two month follow up compared to baseline.[42]
Mental ill-health (most had moderate-severe)	

MOST+ (Enhanced Moderated Online Social Therapy) is a multimodal, scalable digital mental health service which merges real-time, clinician-delivered web chat counselling, interactive user-directed online therapy, expert and peer moderation and peer-to-peer social networking.[41]	• MOST+ was found to be feasible, acceptable, and safe:
	  ○ 82% reported that using MOST+ helped them feel better
	  ○ 86% felt more socially connected
	  ○ 92% said they would recommend it to others
	  ○ 97% reported feeling safe
	  ○ no serious adverse events or inappropriate use were detected.
	• Statistically significant improvements in 8 of the 11 secondary outcomes assessed: psychological distress (d=-0.39; P<.001), perceived stress (d=-0.44; P<.001), psychological wellbeing (d=0.51; P<.001), depression (d=-0.29; P<.001), loneliness (d=-0.23; P=.04), social support (d=0.30; P<.001), autonomy (d=0.36; P=.001) and self-competence (d=0.30; P<.001).[41]

Emerging mental health problems	

ENYOY is the Dutch version of the original moderated online social therapy platform (MOST+) from Australia. It aims to help young people with emerging mental health complaints.[44, 45]	• Two mixed methods studies found the platform:
	  ○ had high usability and positive user experiences (van doorn moderated)
	  ○ was acceptable and showed moderate usability. The level one findings showed different individual effects on perceived stress and emotional awareness, while the level two analyses had no overall effects on these outcomes.[44]

Borderline personality disorder	
Kindred is a novel online intervention for carers of young people with borderline personality disorder. It incorporates online psychoeducation, carer-to-carer social networking and guidance from expert and peer moderators.[46]	• A pilot trial found the intervention was acceptable, usable and safe. • Carer burden, stress, expressed emotion, family communication, quality of life, functioning, coping and perceived knowledge of borderline personality disorder were improved at three months compared with baseline.[46]
Suicidal ideation	
Affinity is a closed website with three key components: therapeutic content delivered via comics, peer-to-peer social networking and moderation by peers and clinicians.[49]	• Semi-structured interviews with young people identified four overarching themes: a safe and supportive environment, the importance of mutual experiences, difficulty engaging and connecting, and the pros and cons of banning discussions about suicide.[49]

Grey literature

Table 5: Grey literature - digital mental health interventions

Note some of the information has been copied directly from the source material.

Source	Model description and features	Key outcomes (cost, efficiency)

Maximising the potential of digital in mental health
NHS Confederation, 2023
	• For DMHIs to be an effective enabler for mental health services and improving population mental health, three principles are fundamental to future work:
	  ○ collaboration
	  ○ clarity
	  ○ coordination between stakeholders.
	• The United Kingdom in 2023 announced investments into digital mental health, and recommendations were made in the Hewitt review of integrated care systems for how digital tools and apps can play a vital role in enabling integrated care systems to improve population health outcomes.
		Benefits
		• Improved treatment outcomes: Digital mental health interventions, when evidence-based, can lead to positive treatment outcomes and better overall mental wellbeing for users.
		• Reduced stigma: Online platforms may reduce the stigma associated with seeking mental health support, as individuals can access help discreetly from the comfort of their own homes.
		• Scalability: Digital solutions have the potential to scale rapidly, allowing mental health resources to reach a larger audience in a short period.
		• Diverse modalities: Digital mental health encompasses various modalities such as mobile apps, virtual reality and online therapy, catering to different needs and preferences.
		• Value for money: Through direct cost savings, avoiding additional costs by intervening earlier and allowing for increased reach and ongoing support between clinical interventions, digital mental health services have shown to provide positive economic benefits and a return on investment.

Literature review of effectiveness of supported digital mental health interventions
University of Melbourne, 2022
	• Digital mental health services are delivered online via desktops, mobile devices and apps or via telephone crisis and counselling services.
	• The literature review examined supported DMHIs that consisted of guidance by therapist or counsellor through:
	  ○ phone
	  ○ email
		• Reviews suggests that supported DMHIs are effective for treating depression, anxiety disorders and binge eating disorder.
		• Evidence shows that supported digital mental health interventions and face-to-face psychotherapy for depression result in similar rates of response to treatment, remission and deterioration.

	○ chat sessions or face to face during module completion ○ text messaging ○ webpage messaging ○ video conferencing ○ online discussion forums.	• There is a small to moderate effect of supported digital mental health interventions for depression in youth, but a suggestion of publication bias tempers this. • High levels of support may be especially important for youth. Based on a few studies, there seems to be no difference in the effectiveness of supported DMHIs and usual care or other active comparison interventions in treating depression in youth. • The effect of supported DMHIs for anxiety in youth is small to moderate. • The existing economic evaluation evidence shows that the provision of supported DMHIs are generally low cost and effective.
Environmental scan of digital mental health services University of Melbourne, 2022	• The Centre for Mental Health at the University of Melbourne was commissioned by the Department of Health to undertake an environmental scan, conducted as one component of an evaluation of supported DMHIs for mental disorders. • A range of Australian online digital mental health services for youth and young adults are available and include: ○ Chilled Out Online ○ Cool Kids Online ○ Mental Health Online ○ MindSpot ○ Moderated Online Social Therapy (MOST) ○ My Digital Health ○ This Way Up	**Effectiveness** • Further research is needed to explore the efficacy of these interventions with traditionally underserviced populations (e.g. culturally and linguistically diverse populations, Aboriginal and Torres Strait Islanders, LGBTQIA+). • There is an underdeveloped evidence base regarding the effectiveness and efficacy of using DMHIs for treating severe mental disorders • Efficacy from gold standard RCTs and effectiveness from real-world data are the most reported outcomes of digital mental health interventions and digital mental health services respectively. Data from trials and routine care indicate that interventions and services, particularly those involving CBT and support or guidance, work and have the potential to be good value for money. • The evidence is strongest for adults with depression and anxiety disorders.

	• All services include features of online modules, skill-based programs, phone sessions or online chat sessions.	**Cost-effectiveness** • There is increasing evidence to support the cost-effectiveness of digital mental health services, including both self-help and therapist-guided modalities. However, future development needs to explore whether costs of services impede access or whether costs are associated with greater commitment and completion rates of programs. • Integrating digital mental health services within existing health services and the forthcoming national digital mental health platform has the potential to lead to cost efficiencies. • There is an underdeveloped evidence-base about what cost could be saved by early intervention through digital mental health interventions. **Barriers** • Barriers for consumers include lack of awareness of digital mental health services and how to access them; perceived lack of effectiveness; poor English literacy; low computer competency; inadequate internet connectivity; cultural appropriateness; and concerns about data privacy, safety and confidentiality. • Barriers for health professionals include lack of familiarity and awareness; lack of confidence and skills; perceptions that clients have poor internet or out-of-date device; lack of time and motivation to learn new ways of delivering services; concerns about workflow disruption and additional workload; low expectations about effectiveness; concerns about consent, risk management, confidentiality and data security; and perceived loss of therapeutic relationship.

		• At the organisational level, concerns that funding of digital mental health interventions may lead to redirection of funds from other underinvested (rural and remote) services acted as a barrier to adoption.
Digital interventions in mental health: evidence syntheses and economic modelling National Institute for Health Research, 2022	• Grey literature report that examined: ○ 76 published economic evaluations of digital interventions for different mental health and addiction problems ○ pooled research studies that evaluated the outcomes of digital interventions in reducing anxiety and worry.	• Digital interventions could offer good value for money as an alternative to doing nothing, simply monitoring someone or giving them general information. • The picture was unclear when digital interventions were compared with face-to-face therapy. • An economic model suggested that value for money in digital interventions is driven by how good they are and not by how much they cost. • Children and young people may not be more likely to engage with digital interventions. Stakeholders reported young people may prefer something different from technology, if they associate digital with schoolwork or social peer pressure.

Table 6: Grey literature – social therapies

Note some of the information has been copied directly from the source material.

Source	Summary
News articles	• Multiple news articles about the 1.5-million-dollar investment to enhance youth mental health services in NSW through the MOST platform.
Moderated online social therapy	• Flyer outlining what the MOST platform is. • The platform is an online mental health support for young people aged 15-25 (inclusive). • It helps young people work towards mental health goals, seek support, and connect with others. • It is free and available at any time.

Appendix 1

PubMed search strategy

(("digital"[Title/Abstract] OR "online"[Title/Abstract] OR "internet"[Title/Abstract] OR "mHealth"[Title/Abstract] OR "eHealth"[Title/Abstract] OR "desktop"[Title/Abstract] OR "telehealth"[Title/Abstract] OR "telemedicine"[Title/Abstract] OR "e-mental health"[Title/Abstract]) AND ("anxiety"[Title/Abstract] OR "depression"[Title/Abstract] OR "bipolar disorder"[Title/Abstract] OR "psychosis"[Title/Abstract] OR "schizophrenia"[Title/Abstract] OR "eating disorder*"[Title/Abstract] OR "post-traumatic stress disorder"[Title/Abstract] OR "personality disorder*"[Title/Abstract] OR "mental health"[Title/Abstract]) AND ("adolescent"[MeSH Terms] OR "adolescent*"[Title/Abstract] OR "youth"[Title/Abstract] OR "young people"[Title/Abstract] OR "teenager*"[Title/Abstract]) AND 2018/01/01:3000/12/31[Date - Publication]) AND (systematicreview[Filter] OR meta-analysis[Filter] OR “systematic review”[Title] OR meta-analysis[Title])

= 296 hits on 26 September 2023.

Grey-literature search strategy

Google was searched using a combination of key words such as “digital mental health intervention” or “digital social therapy” AND “adolescents” or “young people”. Only the first three pages of the search results were screened.

Inclusion and exclusion criteria

Inclusion	Exclusion
• Published in English • Published since 2018 • **P**opulation: young people aged 12-25 years and with severe and complex mental illness (anxiety, depression, bipolar disorder, psychosis and/or schizophrenia, eating disorders, post-traumatic stress disorder, personality disorders) *Note on age group: studies were searched using terms adolescents and youth, and were excluded if more than 50% of total participants were adults (even if there was some overlap in this age group e.g. included people over 18 years was excluded)* • **I**ntervention: digital mental health interventions or social therapies that are delivered via a digital platform; and delivered in the partnership with, or alongside	• Not in English • Published prior to 2018 • Review protocols • Studies that do not meet **PICOS** criteria • Disease prevention • Mild to moderate mental illness • Smartphone apps (such as mindfulness apps) or therapeutic videogames exclusively • Neurobehavioral disorders (e.g. attention deficit hyperactivity disorder) or addiction disorders in the absence of mental health problems (in review articles if majority of studies were on these groups, the study was excluded) • People with a primary diagnosis of other neurodiverse conditions

Inclusion	Exclusion
specialist youth mental health services at a tertiary level • **C**omparison: usual care or other types of interventions • **O**utcomes: health, clinical and social outcomes, feasibility of service, acceptability of service by young people, family and carers and service providers, economic outcomes and any other relevant outcomes • **S**tudy types: ○ Systematic reviews and meta-analysis ○ Review studies with systematic search strategy and methods ○ Grey literature, such as guidelines and consensus statements • **S**tudy setting: ○ High income OECD countries with similar healthcare systems to Australia	• Populations with physical health conditions where improving mental health symptoms was a secondary goal OR where these studies were pooled with other eligible studies • Non-clinical populations (e.g. employees, university students) • Services focused on prevention of mental disorders or general wellbeing (e.g. mindfulness) • Stand-alone psychoeducational tools • Care planning support and tools • Crisis telephone line support • Telehealth as a mode to deliver usual care • Social interventions that aren't facilitated clinically, such as social chat rooms • Situation based mental illness, such as those associated with a natural disaster • Primary or community level care • Methods studies, comments and descriptive studies

Additional notes on evidence check methods

ACI rapid reviews are not intended to be exhaustive systematic reviews (multiple databases, formal critical appraisal, etc.) but instead rapid and responsive evidence summaries maintaining quality through a range of measures:

- search terms for PubMed developed by evidence team and checked by clinical network or requester
- restricting included literature to the highest levels of evidence available for a particular topic
- single reviewer screening and data extraction, with consultation in case of any uncertainty
- review of evidence check by: 2x evidence team review, ACI clinical network or requester and external peer reviewers.[59]

Data extraction

A data extraction table including intervention description, features and key outcomes were completed for systematic reviews (table 1). Many systematic reviews included studies on patients who ranged from mild to severe mental health. As the key population of this evidence check is those with severe conditions, individual RCTs including people with severe mental health conditions and published since

2018 were extracted in a separate table (table 2) and a supplementary RCT search run to cross check these results.

Preliminary findings

Relevant articles were found for question on digital health interventions, but few cost-effectiveness studies and no social interventions were found that met the inclusion criteria. While this is a finding, we ran some supplementary searches to identify studies that may be relevant.

- For cost effectiveness studies, this meant broadening the scope to adult populations and to also include individual cost-effectiveness studies. Due to the overlap with the Melbourne University review and their comprehensive inclusion of cost studies, studies were only screened from 2021 onwards.
- For social therapies, this meant removing the systematic review filter to capture individual studies.

Supplementary search terms

Randomised controlled trials for diagnosed or severe and/or complex mental health conditions

Search: ((("digital"[Title/Abstract] OR "online"[Title/Abstract] OR "internet"[Title/Abstract] OR "mHealth"[Title/Abstract] OR "eHealth"[Title/Abstract] OR "desktop"[Title/Abstract] OR "telehealth"[Title/Abstract] OR "telemedicine"[Title/Abstract] OR "e-mental health"[Title/Abstract]) AND ("anxiety"[Title/Abstract] OR "depression"[Title/Abstract] OR "bipolar disorder"[Title/Abstract] OR "psychosis"[Title/Abstract] OR "schizophrenia"[Title/Abstract] OR "eating disorder*"[Title/Abstract] OR "post-traumatic stress disorder"[Title/Abstract] OR "personality disorder*"[Title/Abstract] OR "mental health"[Title/Abstract]) AND ("adolescent"[MeSH Terms] OR "adolescent*"[Title/Abstract] OR "youth"[Title/Abstract] OR "young people"[Title/Abstract] OR "teenager*"[Title/Abstract]) AND 2018/01/01:3000/12/31[Date - Publication]) AND (severe[tiab] OR complex[tiab] OR clinical[tiab] OR diagnos*[tiab]) AND ((clinicaltrial[Filter] OR comparativestudy[Filter]) AND (english[Filter]) AND (2018:2023[pdat])) Filters: Clinical Trial, Comparative Study, English, Clinical Trial, Comparative Study, English

=21 hits on 12 Oct 2023.

Cost effectiveness studies

(("Costs and Cost Analysis"[Mesh]) AND (("digital"[Title/Abstract] OR "online"[Title/Abstract] OR "internet"[Title/Abstract] OR "mHealth"[Title/Abstract] OR "eHealth"[Title/Abstract] OR "desktop"[Title/Abstract] OR "telehealth"[Title/Abstract] OR "telemedicine"[Title/Abstract] OR "e-mental health"[Title/Abstract]) AND ("anxiety"[Title/Abstract] OR "depression"[Title/Abstract] OR "bipolar disorder"[Title/Abstract] OR "psychosis"[Title/Abstract] OR "schizophrenia"[Title/Abstract] OR "eating disorder*"[Title/Abstract] OR "post-traumatic stress disorder"[Title/Abstract] OR "personality disorder*"[Title/Abstract] OR "mental health"[Title/Abstract]))) AND (2021/01/01:3000/12/31[Date - Publication])

= 142 hits on 13 Oct 2023.

Social therapies

("social therapy"[Title/Abstract] OR "social therapies"[Title/Abstract]) AND ("anxiety"[Title/Abstract] OR "depression"[Title/Abstract] OR "bipolar disorder"[Title/Abstract] OR "psychosis"[Title/Abstract] OR "schizophrenia"[Title/Abstract] OR "eating disorder*"[Title/Abstract] OR "post-traumatic stress

disorder"[Title/Abstract] OR "personality disorder*"[Title/Abstract] OR "mental health"[Title/Abstract]) AND ("adolescent"[MeSH Terms] OR "adolescent*"[Title/Abstract] OR "youth"[Title/Abstract] OR "young people"[Title/Abstract] OR "teenager*"[Title/Abstract]) AND 2018/01/01:3000/12/31[Date - Publication])

= 19 hits on 13 Oct 2023.

A quick validation search to check if “online group therapy” would bring up additional studies was also run, but nothing relevant retrieved.

(((online[Title/Abstract]) AND ("group therapy"[Title/Abstract])) AND (("anxiety"[Title/Abstract] OR "depression"[Title/Abstract] OR "bipolar disorder"[Title/Abstract] OR "psychosis"[Title/Abstract] OR "schizophrenia"[Title/Abstract] OR "eating disorder*"[Title/Abstract] OR "post-traumatic stress disorder"[Title/Abstract] OR "personality disorder*"[Title/Abstract] OR "mental health"[Title/Abstract]) AND ("adolescent"[MeSH Terms] OR "adolescent*"[Title/Abstract] OR "youth"[Title/Abstract] OR "young people"[Title/Abstract] OR "teenager*"[Title/Abstract]) AND 2018/01/01:3000/12/31[Date - Publication]))

= 5 hits on 17 Oct 2023.

References

1. Alvarez-Jimenez M, Koval P, Schmaal L, et al. The Horyzons project: a randomized controlled trial of a novel online social therapy to maintain treatment effects from specialist first-episode psychosis services. World Psychiatry. Jun 2021;20(2):233-43. DOI: 10.1002/wps.20858
2. Engel L, Alvarez-Jimenez M, Cagliarini D, et al. The Cost-Effectiveness of a Novel Online Social Therapy to Maintain Treatment Effects From First-Episode Psychosis Services: Results From the Horyzons Randomized Controlled Trial. Schizophr Bull. Jun 1 2023. DOI: 10.1093/schbul/sbad071
3. Nordh M, Wahlund T, Jolstedt M, et al. Therapist-Guided Internet-Delivered Cognitive Behavioral Therapy vs Internet-Delivered Supportive Therapy for Children and Adolescents With Social Anxiety Disorder: A Randomized Clinical Trial. JAMA Psychiatry. 1 Jul 2021;78(7):705-13. DOI: 10.1001/jamapsychiatry.2021.0469
4. Jolstedt M, Wahlund T, Lenhard F, et al. Efficacy and cost-effectiveness of therapist-guided internet cognitive behavioural therapy for paediatric anxiety disorders: a single-centre, single-blind, randomised controlled trial. Lancet Child Adolesc Health. Nov 2018;2(11):792-801. DOI: 10.1016/s2352-4642(18)30275-x
5. Gega L, Jankovic D, Saramago P, et al. Digital interventions in mental health: evidence syntheses and economic modelling. Health Technol Assess. Jan 2022;26(1):1-182. DOI: 10.3310/rcti6942
6. Rohrbach PJ, Dingemans AE, Evers C, et al. Cost-effectiveness of Internet Interventions Compared With Treatment as Usual for People With Mental Disorders: Systematic Review and Meta-analysis of Randomized Controlled Trials. J Med Internet Res. 5 Jan 2023;25:e38204. DOI: 10.2196/38204
7. Jankovic D, Saramago Goncalves P, Gega L, et al. Cost Effectiveness of Digital Interventions for Generalised Anxiety Disorder: A Model-Based Analysis. Pharmacoecon Open. May 2022;6(3):377-88. DOI: 10.1007/s41669-021-00318-y
8. Li M, Bai F, Yao L, et al. Economic Evaluation of Cognitive Behavioral Therapy for Depression: A Systematic Review. Value Health. Jun 2022;25(6):1030-41. DOI: 10.1016/j.jval.2021.11.1379
9. Lehtimaki S, Martic J, Wahl B, et al. Evidence on Digital Mental Health Interventions for Adolescents and Young People: Systematic Overview. JMIR Ment Health. Apr 29 2021;8(4):e25847. DOI: 10.2196/25847

10. Wu Y, Fenfen E, Wang Y, et al. Efficacy of internet-based cognitive-behavioral therapy for depression in adolescents: A systematic review and meta-analysis. Internet Interventions. 01 Dec 2023 2023;34:100673. DOI: 10.1016/j.invent.2023.100673
11. Grist R, Croker A, Denne M, et al. Technology Delivered Interventions for Depression and Anxiety in Children and Adolescents: A Systematic Review and Meta-analysis. Clin Child Fam Psychol Rev. Jun 2019;22(2):147-71. DOI: 10.1007/s10567-018-0271-8
12. Christ C, Schouten MJ, Blankers M, et al. Internet and Computer-Based Cognitive Behavioral Therapy for Anxiety and Depression in Adolescents and Young Adults: Systematic Review and Meta-Analysis. J Med Internet Res. Sep 25 2020;22(9):e17831. DOI: 10.2196/17831
13. Wickersham A, Barack T, Cross L, et al. Computerized Cognitive Behavioral Therapy for Treatment of Depression and Anxiety in Adolescents: Systematic Review and Meta-analysis. J Med Internet Res. 2022/4/11 2022;24(4):e29842. DOI: 10.2196/29842
14. Garrido S, Millington C, Cheers D, et al. What Works and What Doesn't Work? A Systematic Review of Digital Mental Health Interventions for Depression and Anxiety in Young People. Front Psychiatry. 2019;10:759. DOI: 10.3389/fpsyt.2019.00759
15. Domhardt M, Steubl L, Baumeister H. Internet- and Mobile-Based Interventions for Mental and Somatic Conditions in Children and Adolescents. Z Kinder Jugendpsychiatr Psychother. Jan 2020;48(1):33-46. DOI: 10.1024/1422-4917/a000625
16. Eilert N, Wogan R, Leen A, et al. Internet-Delivered Interventions for Depression and Anxiety Symptoms in Children and Young People: Systematic Review and Meta-analysis. JMIR Pediatr Parent. May 12 2022;5(2):e33551. DOI: 10.2196/33551
17. Cervin M, Lundgren T. Technology-delivered cognitive-behavioral therapy for pediatric anxiety disorders: a meta-analysis of remission, posttreatment anxiety, and functioning. J Child Psychol Psychiatry. Jan 2022;63(1):7-18. DOI: 10.1111/jcpp.13485
18. Blanco D, Roberts RM, Gannoni A, et al. Assessment and treatment of mental health conditions in children and adolescents: A systematic scoping review of how virtual reality environments have been used. Clin Child Psychol Psychiatry. Sep 22 2023:13591045231204082. DOI: 10.1177/13591045231204082
19. Babiano-Espinosa L, Wolters LH, Weidle B, et al. Acceptability, feasibility, and efficacy of Internet cognitive behavioral therapy (iCBT) for pediatric obsessive-compulsive disorder: a systematic review. Syst Rev. Nov 20 2019;8(1):284. DOI: 10.1186/s13643-019-1166-6
20. Ferrari M, Sabetti J, McIlwaine SV, et al. Gaming My Way to Recovery: A Systematic Scoping Review of Digital Game Interventions for Young People's Mental Health Treatment and Promotion. Front Digit Health. 2022;4:814248. DOI: 10.3389/fdgth.2022.814248
21. Wozney L, McGrath PJ, Gehring ND, et al. eMental Healthcare Technologies for Anxiety and Depression in Childhood and Adolescence: Systematic Review of Studies Reporting Implementation Outcomes. JMIR Ment Health. Jun 26 2018;5(2):e48. DOI: 10.2196/mental.9655
22. d'Halluin A, Costa M, Morgiève M, et al. Attitudes of Children, Adolescents, and Their Parents Toward Digital Health Interventions: Scoping Review. J Med Internet Res. May 2 2023;25:e43102. DOI: 10.2196/43102
23. Liverpool S, Mota CP, Sales CMD, et al. Engaging Children and Young People in Digital Mental Health Interventions: Systematic Review of Modes of Delivery, Facilitators, and Barriers. J Med Internet Res. Jun 23 2020;22(6):e16317. DOI: 10.2196/16317
24. McCashin D, Coyle D, O'Reilly G. Qualitative Synthesis of Young People's Experiences With Technology-Assisted Cognitive Behavioral Therapy: Systematic Review. J Med Internet Res. Nov 12 2019;21(11):e13540. DOI: 10.2196/13540
25. Dewa LH, Lawrance E, Roberts L, et al. Quality Social Connection as an Active Ingredient in Digital Interventions for Young People With Depression and Anxiety: Systematic Scoping Review and Meta-analysis. J Med Internet Res. Dec 17 2021;23(12):e26584. DOI: 10.2196/26584

26. Piers R, Williams JM, Sharpe H. Review: Can digital mental health interventions bridge the 'digital divide' for socioeconomically and digitally marginalised youth? A systematic review. Child Adolesc Ment Health. Feb 2023;28(1):90-104. DOI: 10.1111/camh.12620
27. Litke SG, Resnikoff A, Anil A, et al. Mobile Technologies for Supporting Mental Health in Youths: Scoping Review of Effectiveness, Limitations, and Inclusivity. JMIR Ment Health. 23 Aug 2023;10:e46949. DOI: 10.2196/46949
28. Staples LG, Dear BF, Johnson B, et al. Internet-delivered treatment for young adults with anxiety and depression: Evaluation in routine clinical care and comparison with research trial outcomes. J Affect Disord. 01 Sep 2019;256:103-9. DOI: 10.1016/j.jad.2019.05.058
29. Schniering CA, Einstein D, Kirkman JJL, et al. Online treatment of adolescents with comorbid anxiety and depression: A randomized controlled trial. J Affect Disord. 15 Aug 2022;311:88-94. DOI: 10.1016/j.jad.2022.05.072
30. Dear BF, Fogliati VJ, Fogliati R, et al. Treating anxiety and depression in young adults: A randomised controlled trial comparing clinician-guided versus self-guided Internet-delivered cognitive behavioural therapy. Aust N Z J Psychiatry. Jul 2018;52(7):668-79. DOI: 10.1177/0004867417738055
31. Geirhos A, Domhardt M, Lunkenheimer F, et al. Feasibility and potential efficacy of a guided internet- and mobile-based CBT for adolescents and young adults with chronic medical conditions and comorbid depression or anxiety symptoms (youthCOACHCD): a randomized controlled pilot trial. BMC Pediatrics. 29 Jan 2022;22(1):69. DOI: 10.1186/s12887-022-03134-3
32. Wisman MA, Emmelkamp J, Dekker JJM, et al. Internet-based emotion-regulation training added to CBT in adolescents with depressive and anxiety disorders: A pilot randomized controlled trial to examine feasibility, acceptability, and preliminary effectiveness. Internet Interventions. 01 Mar 2023;31:100596. DOI: 10.1016/j.invent.2022.100596
33. Grudin R, Ahlen J, Mataix-Cols D, et al. Therapist-guided and self-guided internet-delivered behavioural activation for adolescents with depression: a randomised feasibility trial. BMJ Open. Dec 26 2022;12(12):e066357. DOI: 10.1136/bmjopen-2022-066357
34. Mechler J, Lindqvist K, Carlbring P, et al. Therapist-guided internet-based psychodynamic therapy versus cognitive behavioural therapy for adolescent depression in Sweden: a randomised, clinical, non-inferiority trial. Lancet Digit Health. Aug 2022;4(8):e594-e603. DOI: 10.1016/s2589-7500(22)00095-4
35. Zhang A, Weaver A, Walling E, et al. Evaluating an engaging and coach-assisted online cognitive behavioral therapy for depression among adolescent and young adult cancer survivors: A pilot feasibility trial. J Psychosoc Oncol. 2023;41(1):20-42. DOI: 10.1080/07347332.2021.2011530
36. Lindqvist K, Mechler J, Carlbring P, et al. Affect-Focused Psychodynamic Internet-Based Therapy for Adolescent Depression: Randomized Controlled Trial. J Med Internet Res. Mar 30 2020;22(3):e18047. DOI: 10.2196/18047
37. Ritvo P, Knyahnytska Y, Pirbaglou M, et al. Online Mindfulness-Based Cognitive Behavioral Therapy Intervention for Youth With Major Depressive Disorders: Randomized Controlled Trial. J Med Internet Res. Mar 10 2021;23(3):e24380. DOI: 10.2196/24380
38. Leigh E, Clark DM. Internet-delivered therapist-assisted cognitive therapy for adolescent social anxiety disorder (OSCA): a randomised controlled trial addressing preliminary efficacy and mechanisms of action. J Child Psychol Psychiatry. Jan 2023;64(1):145-55. DOI: 10.1111/jcpp.13680
39. Biagianti B, Conelea C, Dabit S, et al. A Mobile Application Adjunct to Augment Cognitive-Behavioral Group Therapy for Adolescents with Social Anxiety: Feasibility and Acceptability Results from the Wiring Adolescents with Social Anxiety via Behavioral Interventions Pilot Trial. J Child Adolesc Psychopharmacol. Aug 2023;33(6):212-24. DOI: 10.1089/cap.2023.0001
40. Aspvall K, Andersson E, Melin K, et al. Effect of an Internet-Delivered Stepped-Care Program vs In-Person Cognitive Behavioral Therapy on Obsessive-Compulsive Disorder Symptoms in Children and Adolescents: A Randomized Clinical Trial. JAMA. 11 May 2021;325(18):1863-73. DOI: 10.1001/jama.2021.3839

41. Alvarez-Jimenez M, Rice S, D'Alfonso S, et al. A Novel Multimodal Digital Service (Moderated Online Social Therapy+) for Help-Seeking Young People Experiencing Mental Ill-Health: Pilot Evaluation Within a National Youth E-Mental Health Service. J Med Internet Res. 13 Aug 2020;22(8):e17155. DOI: 10.2196/17155
42. Alvarez-Jimenez M, Gleeson JF, Bendall S, et al. Enhancing social functioning in young people at Ultra High Risk (UHR) for psychosis: A pilot study of a novel strengths and mindfulness-based online social therapy. Schizophr Res. Dec 2018;202:369-77. DOI: 10.1016/j.schres.2018.07.022
43. Gleeson J, Lin A, Koval P, et al. Moderated Online Social Therapy for Carers of Early Psychosis Clients in Real-World Settings: Cluster Randomized Controlled Trial. JMIR Ment Health. Sep 6 2023;10:e47722. DOI: 10.2196/47722
44. van Doorn M, Nijhuis LA, Monsanto A, et al. Usability, Feasibility, and Effect of a Biocueing Intervention in Addition to a Moderated Digital Social Therapy-Platform in Young People With Emerging Mental Health Problems: A Mixed-Method Approach. Front Psychiatry. 2022;13:871813. DOI: 10.3389/fpsyt.2022.871813
45. van Doorn M, Monsanto A, Boeschoten CM, et al. Moderated digital social therapy for young people with emerging mental health problems: A user-centered mixed-method design and usability study. Front Digit Health. 2022;4:1020753. DOI: 10.3389/fdgth.2022.1020753
46. Gleeson J, Alvarez-Jimenez M, Betts JK, et al. A pilot trial of moderated online social therapy for family and friends of young people with borderline personality disorder features. Early Interv Psychiatry. Dec 2021;15(6):1564-74. DOI: 10.1111/eip.13094
47. D'Alfonso S, Santesteban-Echarri O, Rice S, et al. Artificial Intelligence-Assisted Online Social Therapy for Youth Mental Health. Front Psychol. 2017;8:796. DOI: 10.3389/fpsyg.2017.00796
48. Gleeson JFM, Koval P, Zyphur M, et al. A randomized controlled trial of moderated online social therapy for family carers of first-episode psychosis patients in a specialist treatment setting. Schizophr Res. May 2023;255:203-12. DOI: 10.1016/j.schres.2023.03.019
49. Bailey E, Robinson J, Alvarez-Jimenez M, et al. Moderated Online Social Therapy for Young People With Active Suicidal Ideation: Qualitative Study. J Med Internet Res. 5 Apr 2021;23(4):e24260. DOI: 10.2196/24260
50. Bassilios B, Morgan A, Tan A, et al. Literature review of effectiveness of supported digital mental health interventions (DMHIs). 2022.
51. National Institute for Health and Care Excellence (NICE). Digital mental health tech for children and young people recommended by NICE in first rapid healthtech guidance. London: NICE; 2023 [cited 18 Oct 2023]. Available from: https://www.nice.org.uk/news/article/digital-mental-health-tech-for-children-and-young-people-recommended-by-nice-in-first-rapid-healthtech-guidance
52. NHS Confederation. Maximising the potential of digital in mental health. London: NHS confederation; 2023 [cited 18 Oct 2023]. Available from: https://www.nhsconfed.org/publications/maximising-potential-digital-mental-health
53. Bassilios B, Ftanou M, Tan A, et al. Environmental scan of digital mental health services. 2022.
54. Gega L, Jankovic D, Saramago P, et al. Digital interventions in mental health: evidence syntheses and economic modelling. Health Technology Assessment (Winchester, England). 2022;26(1):1.
55. NSW Ministry of Health. Future Health: Guiding the next decade of care in NSW 2022-2032. Sydney: NSW Ministry of Health; 2022 [cited 26 September 2023]. Available from: https://www.health.nsw.gov.au/about/nswhealth/Pages/future-health.aspx.
56. Australian Commission on Safety and Quality in Health Care. National Safety and Quality Digital Mental Health Standards. Australia: ACSQHC; 2020 [cited 26 September 2023]. Available from: https://www.safetyandquality.gov.au/standards/national-safety-and-quality-digital-mental-health-standards.
57. Australian Government Productivity Commission. Inquiry Report: Mental Health Volume 2. Canberra: Productivity Commission; 2020 [cited 26 September 2023]. Available from: https://www.pc.gov.au/inquiries/completed/mental-health/report/mental-health-volume2.pdf.

58. Valentine L, McEnery C, O'Sullivan S, et al. Young people's experience of online therapy for first-episode psychosis: A qualitative study. Psychol Psychother. Mar 2022;95(1):155-72. DOI: 10.1111/papt.12356
59. Laura W, Erin M, Hankiz D, et al. Horizon scanning, rapid reviews and living evidence to support decision-making: lessons from the work of the Critical Intelligence Unit in New South Wales, Australia during the COVID-19 pandemic. BMJ Open. 2023;13(5):e071003. DOI: 10.1136/bmjopen-2022-071003

SHPN: (ACI) 240116 | ISBN: 978-1-76023-790-5 | CM: ACI/D23/4024-02 | Edition 1