



Active Ingredients for Addressing Youth Anxiety and Depression 3

Harnessing emotional mental imagery to reduce anxiety and depression in young people: an integrative review of progress and promise

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This is the third in a *Series* of three papers about active ingredients for addressing youth anxiety and depression

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Emotional mental imagery is a powerful part of our mental landscape. Given its capacity to depict, process, and generate emotional events, mental imagery could have an important role in psychological therapies. This Series paper explores whether harnessing emotional mental imagery is meaningful to young people; ways in which interventions use emotional mental imagery; contextual and individual factors influencing intervention effectiveness; and mechanisms underpinning imagery techniques. We completed a systematic review of imagery interventions and consulted young people with lived experience (n=10) and leading international experts (n=7). The systematic search identified 86 papers covering a diverse range of imagery interventions. Across the seven categories of techniques reviewed, imagery rescripting for aversive memories, techniques targeting positive imagery, and imagery-enhanced protocols indicated the most potential. The report suggests that harnessing emotional mental imagery in psychological interventions could be a promising approach to reduce anxiety and depression and that mental health science could inform the development of new interventions and help to maximise intervention effectiveness.

Introduction

Innovation is urgently needed for psychological interventions in young people. Less than a quarter of young people with anxiety or depression, or both, access help,¹ and current psychotherapies show only a modest advantage in reducing symptoms of anxiety and depression over usual clinical care.^{2,3} Harnessing the power of emotional mental imagery (EMI) could enhance treatments.

Our mental experience includes not only language-based verbal thoughts but also image-based representations⁴ (ie, representations with accompanying sensory information in the absence of a direct external stimulus).^{5–7} EMI involves the ability to simulate and manipulate multi-sensory experiences within the so-called mind's eye by use of internal representations (eg, memories of past events and projections of future events). EMI draws on neural mechanisms that are also involved in perception.⁵ Research and therapy have historically focused on verbal thoughts rather than imagery.^{4,5} Explanations for this focus include methodological constraints (eg, ability to accurately measure EMI) and a focus on behaviourism in 20th century psychology (rather than internal representations).⁵ Increasingly, EMI has been implicated in the development and maintenance of anxiety and depression.^{4,8} Young people with anxiety or depression, or both, can experience images of negative events (eg, intrusive imagery of upsetting memories or future concerns⁹) and have impoverished positive imagery.¹⁰ Given its capacity to depict, process, and generate emotional events, mental imagery could have an important role in therapy. Indeed, imagery-based approaches are

efficacious in adults (eg, imagery rescripting)¹¹ and could be developmentally appropriate and readily used by young people.¹²

This Series paper aims to integrate the evidence for imagery-based approaches with advances in developmental cognitive science to assess progress and emphasise promising future directions, in consultation with young people with lived experience and experts. We focus on age 14–24 years. This period could be a powerful time for intervention, as mental health symptoms commonly emerge, cognitive styles stabilise,¹³ and flexibility and learning potential are increased. Therefore, although negative experiences can alter developmental trajectories resulting in enduring maladaptive changes, intervention could have benefits that are long lasting.³ By incorporating consultation activities (ie, patient and public involvement), we aim to co-produce meaningful insights and future directions. This Series paper explores whether harnessing EMI is meaningful; ways in which interventions use EMI; contextual and individual factors influencing effectiveness; and why these techniques work. Given the notable comorbidity between anxiety and depression, we consider them in parallel. An inclusive approach was taken to the systematic review (eg, including cases studies and clinical and analogue samples, and not excluding studies on post-traumatic stress disorder) as our aim was to capture the heterogeneity of EMI as applied to youth anxiety or depression, or both, and indicate potentially productive future research avenues. Furthermore, some clinicians and researchers suggest that there has been a slow uptake of imagery-based interventions in routine practice, which could be linked

to practitioner concerns regarding safety. Our inclusive approach allowed us to identify any indicators of harm from a broad range of studies and populations.

Methods

Systematic search strategy and selection criteria

The systematic review was prospectively registered (PROSPERO CRD42020190143) and followed PRISMA guidelines. Four electronic databases were searched (ie, PsychINFO, Ovid MEDLINE, PsychARTICLES, and Embase) for papers published from inception to June 24, 2020. The search included terms covering imagery, depression or anxiety, intervention, and youth (full search string available via PROSPERO record⁴). EMI can be accompanied by a feeling of presence and some clinicians and researchers argue that hallucinations are a form of mental imagery.⁶ However, given our focus on anxiety and depression, hallucinations were not included in our search terms. The eligibility criteria were: journal articles published in English; human studies; interventions targeting EMI; focus to reduce anxiety or depression; participant mean age between 14 years and 24 years; empirical data; and potential or actual intervention described. Although post-traumatic stress disorder (PTSD) is classified under stress-related disorders (rather than anxiety disorders), we did not exclude studies targeting PTSD as their primary focus (and including anxiety or depression) when retrieved by use of the depression or anxiety search terms (ie, PTSD was not included as a search term). Two researchers (AS and GW) independently screened the records that were retrieved by title, abstract, and full text. Discrepancies were discussed with a third researcher (VP).

Consultation activities

Ten lived experience representatives (LERs; age range 15–24 years; seven women [four White British, one Asian British, one Chinese, one White European] and three men [two White British, one Asian British]) were invited to provide consultation via online advertisements on dedicated websites. Efforts were taken to encourage diversity in age range, gender, and ethnicity.

Seven international experts (one early career researcher, one lecturer, one senior lecturer, and four professors) who were independent of the current author group were invited to consult on the project. Efforts were taken to ensure that their expertise covered different aspects of the systematic review (eg, negative intrusive imagery or positive future thinking). Five experts also work clinically.

All LERs and experts provided informed consent, with parental consent provided for young people younger than 16 years. All (except one expert) consented to be quoted. Ethical approval was not required as the consultation was classed as patient and public involvement. Separate topic guides, including key questions and prompts, were developed for consultation with LERs and researchers. VP and GW led on the consultation activities.

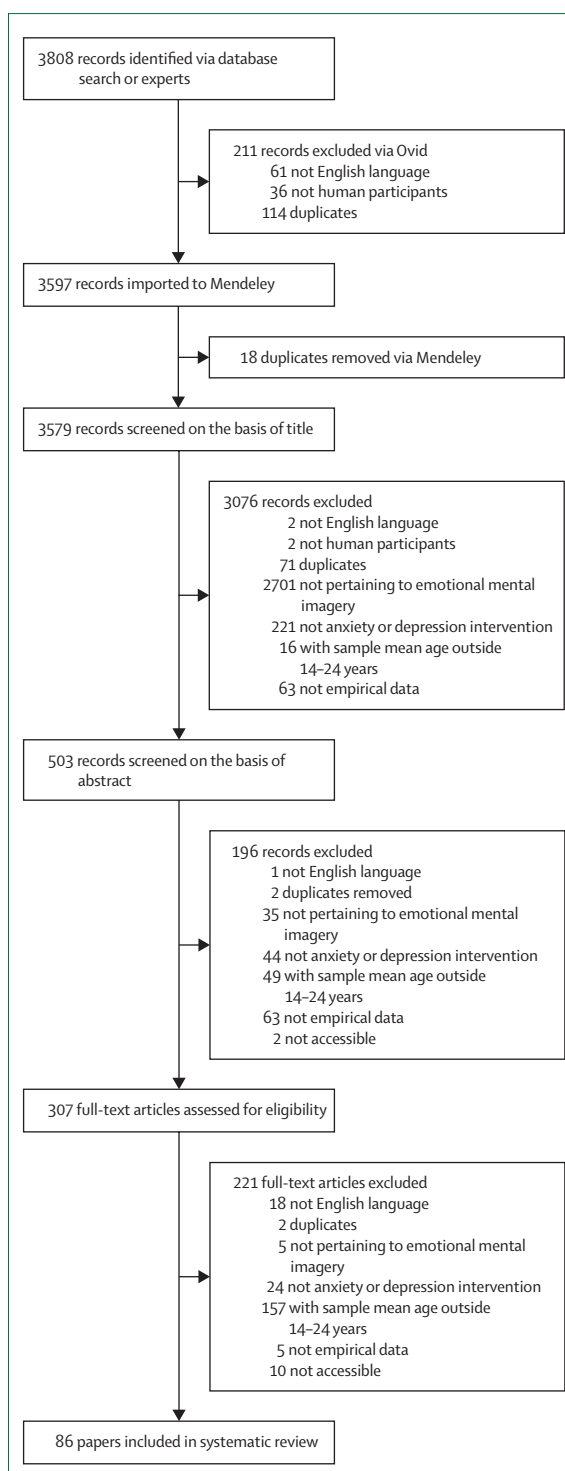


Figure 1: Systematic review flow diagram

Data analysis

Data were extracted from eligible articles by two researchers (AS and GW) and data extraction from 10% of the papers was replicated by a third researcher (VP) and checked for

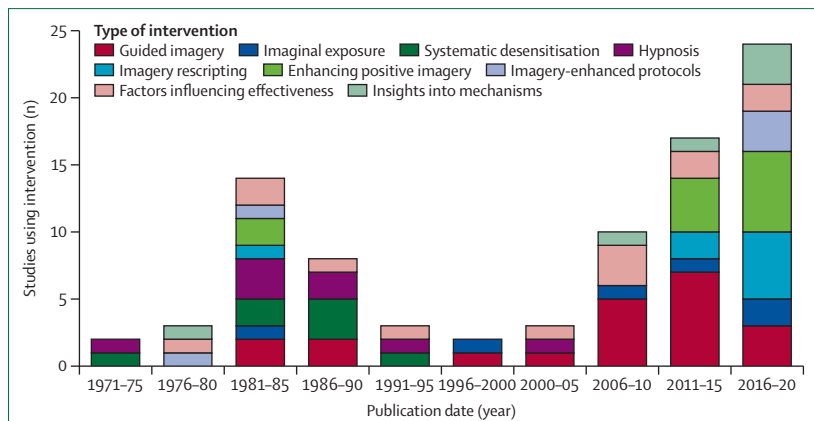


Figure 2: Types of interventions harnessing emotional mental imagery for young people (1972–2020)

discrepancies. Extracted information included study characteristics, intervention characteristics, control group, and outcome data for anxiety or depression. Within-group and between-group effect sizes for the primary outcome were calculated, where possible, by use of Cohen's *d*. Given that our aim was, in part, to represent the diversity in imagery-based approaches, a narrative synthesis rather than a meta-analysis across intervention-type was more appropriate. We categorised papers using a traffic light system (ie, green for positive results in expected direction; orange for mixed results; and red for results indicating potential for harm).

Results

Figure 1 shows the study selection process. 86 papers met the inclusion criteria, with increasing numbers in recent years (figure 2). Most studies focused on participants older than 18 years (70 [81%]) and had a mixture of participant selection criteria: unselected (37 [43%]); selected by diagnosis (24 [28%]) and selected either by use of a questionnaire (23 [27%]) or for another reason (ie, one [1%] for self-harm and one [1%] postoperative). Most studies were in the US (45 [52%]), with almost all research originating from high-income countries (84 [98%]). Ethnicity was rarely reported (24 [28%] studies) and no studies compared gender effects.

Harnessing EMI is meaningful

Consultation with LERs and experts emphasised that EMI forms a powerful and important part of their mental landscape (panel 1). The experts emphasised that simply becoming aware of EMI could be highly beneficial to a young person's thinking, mood, and behaviour (panel 1) and that imagery interventions (other than imaginal exposure) are rarely used in current practice. Similarly, although all of the LERs had undergone interventions for anxiety or depression, none had received imagery-based interventions. Of note, none had previously spoken about EMI in their contact with clinical services.

Possible techniques for EMI

Panel 2 provides an overview of the techniques and the table provides a summary of individual studies. Selected and unselected samples are considered within each category. In terms of whether there were any indicators of harm across studies, only one paper was marked as red in table 1, which used hypnosis in a 16-year-old girl with a complex presentation.²⁸ In this study, hypnosis was reported to reduce anxiety and increase self-esteem but was not helpful in reducing fear of bad things happening (and in-vivo anxiety) and the young person was later admitted to hospital for depression.

Six studies (ie, published from 1984 to 2018) used imaginal exposure for anxiety disorders. Three case studies targeted trauma memories, including interventions to prevent PTSD in the emergency department,²⁰ for PTSD in substance misuse,¹⁵ and for acute stress disorder.¹⁹ All three case studies showed clinically meaningful improvements in PTSD symptoms. A pilot study (*n*=56) investigated computerised imaginal exposure (ie, to improve access) for individuals with increased trauma reactivity and indicated symptom reduction.¹⁶ Eye movement desensitisation and reprocessing proposes that generating lateral eye movements while engaging in imaginal recall can improve therapies. However, one study noted no benefit of adding eye movements to imaginal exposure for public speaking anxiety (*n*=71) in a 90 min experimental intervention.¹⁷ A study using an imagery technique to reduce so-called heterosocial anxiety (*n*=80) did not show differential results unless participants expected positive results from the therapy.¹⁸ In summary, case series and pilot studies suggest that imaginal exposure for trauma memories could reduce symptoms, but there is a dearth of randomised controlled trials in young people.

All seven articles on systematic desensitisation were published between 1972 and 1993; most did not include a control group. Two studies focused on test anxiety,^{23,24} two studies on PTSD,^{26,27} two studies on phobia,^{21,25} and one study on public speaking anxiety.²² Five case studies indicated positive results for the intervention target. The addition of coping imagery (*n*=21) and self-instructional training to a desensitisation intervention significantly reduced test anxiety (within group, *d*=1.48) compared with desensitisation alone (*d*=0.36) and a waitlist control group (*d*=1.90).²⁴ Instructional desensitisation (ie, use of pleasant images to counteract anxiety and reinforce coping behaviour) reduced public speaking anxiety within group (*d*=1.04) and relative to a control intervention (*d*=0.44).²² In summary, although overall results were positive, little work has been done recently (ie, the most recent paper on this topic that was included in our systematic review was published in 1993). The addition of coping imagery in situations that provoke anxiety could be beneficial.

Eight studies (ie, published from 1972 to 2001) used hypnosis. Five case studies indicated reductions in anxiety^{33–35} or the effect of traumatic memories.^{30,31} One case study²⁸ noted that hypnosis was initially helpful

Panel 1: Quotes from young people with lived experience and experts

Examples from lived experience representatives

Imagery as powerful mental evidence

"I think images have more power [than words] because I have it in my internal screen, I see it projected as if it's actually in front of me. It has more power, it's scary and it's more difficult to get rid of this image."

Woman, aged 23 years, White European

"If you can imagine it...it is easier to believe."

Woman, aged 24 years, White British

"Me thinking verbally instead of seeing the images makes me think that it's less likely to happen...if the images come into my head, it makes me feel that's more likely to happen in real life."

Female adolescent, aged 15 years, White British

Past negative imagery

"I have images of when I was bullied at school. This makes me feel useless and hopeless."

Woman, aged 21 years, Asian British

"I always find myself stuck in the past....especially at 17 when things were really bad. I'm replaying it in my head still trying to make sense of it."

Woman, aged 24 years, White British

Future negative imagery

"Pictures like very lonely, on my own, no one to turn to or talk to"

Woman, aged 21 years, Asian British

"[Images of] what would happen if I turned around and punched someone even though I never would act on them. They start coming into my head when I feel like I'm not in control. Then I can't get rid of them"

Woman, aged 17 years, White British

Positive imagery

"I'm just really trapped in how I feel now and all the recent worries I have. Because I feel trapped, these positive images don't really exist. Even if I think about them, they don't do anything for me. They don't make me feel more or bring happiness inside."

Woman, aged 23 years, White European

"I can think of a positive future with my current partner, with my friends and family. I can see these things in my head. Imagining positive things makes me feel happy"

Woman, aged 24 years, White British

Examples from experts

Imagery as powerful mental evidence

"Imagery is a particularly compelling form of mental evidence because it is consciously experienced as representations of real tangible experiences linked to our emotions. We care about it. This is the stuff that matters. It is not just conceptual possibilities and ideas. At the perceptual level, imagining has similar perceptual consequences to actual seeing (albeit at a weaker level)."

"What appear to be long-standing negative beliefs can get changed quite quickly using imagery. There is real potential to make big breakthroughs."

Becoming aware of EMI

"How imagery-based cognition is mediating their experience of reality. Most people don't have any idea."

"When you use imagery experientially, when you tap into a memory or imagine something, there is often that 'OO AH' effect – they realise imagery is something really powerful."

for anxiety, however the young person was later admitted to hospital for depression. One study used group hypnosis ($n=12$, unselected sample, no control), including visualising stressful scenes and coping imagery, for a diverse range of personally identified problems. This study showed pre-post reductions in anxiety ($d=0.89$) and depression ($d=0.98$).³² Another study ($n=60$, unselected sample) showed that, compared with hypnosis alone, rational stage directed hypnotherapy (ie, a cognitive behavioural approach with hypnosis and vivid emotive imagery)²⁹ effectively reduced test anxiety in nursing students at post-test ($d=2.35$) and 2-month follow-up ($d=3.37$). In summary, evidence is mostly from case studies. The addition of a cognitive behavioural structure and vivid emotive imagery to hypnosis protocols could potentially be helpful.

Eight studies used imagery rescripting (ie, published from 1984 to 2020), mostly focusing on rescripting aversive autobiographical memories to reduce anxiety in brief interventions. Three randomised studies^{37,39,41}

showed large within group effect sizes to reduce social anxiety ($d=2.10$; $d=1.09$; $d=3.00$), and two studies showed large effects compared with a passive⁴¹ ($d=0.83$) or active³⁷ control intervention ($d=1.02$). The third study did not show any advantage of imagery rescripting over cognitive restructuring.³⁹ Two further studies showed the benefits of imagery rescripting in non-clinical samples (ie, participants were not selected on the basis of clinical diagnoses). One study showed that imagery rescripting can update the meaning of memories and reduce distress and anxiety that are associated with an aversive self-defining memory ($n=20$, unselected sample).³⁶ Another study showed reduced intrusions, sadness, and distress (and increased mastery) compared with a no-intervention group (sample selected for experiencing stressful life events).⁴² All of these studies were in young people older than 18 years. One case study with a young person aged 16 years showed reductions in anxiety.⁴³

Imagery rescripting has also been applied to other types of images. A case series ($n=9$) used two sessions of

Panel 2: Description of techniques**Imaginal exposure**

Individuals are asked to vividly imagine feared or distressing images or events. Although it can be difficult to imagine traumatic or feared experiences, through extended exposure the intensity of distress is reduced.

Systematic desensitisation

Systematic desensitisation is a highly manualised intervention. Stimuli that provoke anxiety are established in a hierarchy of situations that trigger increasing distress responses. Individuals practice relaxation exercises while visualising the stimuli. Starting from the least distressing stimulus in the fear hierarchy, individuals progress to the stimulus that induces the most anxiety when they can maintain a relaxed response to the current exposure.

Hypnosis

The intervention protocols for hypnosis are variable. Generally, the therapist induces a so-called trance-like state in individuals, in which they are perceived to lose voluntary action and become highly responsive to suggestion or direction. In the context of interventions, this intervention usually aims to imagine, uncover, and face repressed memories.

Imagery rescripting

Imagery rescripting tends to address specific aversive memories, aiming to change their power and meaning.

A common format has three steps. First, an individual will imagine a memory or image as vividly as possible. Second, they identify what needs to change in the image and see the image from the perspective of another compassionate person who can intervene in the image. Third, they generate the image again from their own perspective with the updated meaning or intervention.

Guided imagery

Individuals are asked to assume a relaxed position and focus their awareness on a controlled breathing pattern. During this focused practice, individuals use their imagination to create positive or relaxing images and experiences, using all sensory modalities.

Enhancing positive imagery

Individuals are given scenarios in which they generate detailed positive imagery. This generation can include the final image, images of the steps to reach the final image, and overcoming possible obstacles along the way.

Imagery-enhanced protocols

This technique includes interventions that target both negative and positive imagery. For example, combining imagery rescripting for an aversive image with generating positive future images.

imagery rescripting to successfully reduce test anxiety in university students.³⁸ Another case study showed improvement in anxiety⁴⁰ by introducing incongruent events into imagined scenarios. In summary, evidence for imagery rescripting so far is promising (ie, producing large effects in brief interventions) but has focused on negative images in the context of anxiety. Additionally, expert consultation emphasised imagery rescripting as a powerful technique:

“The presence of involuntary distressing imagery would be a signal that imagery rescripting is likely to be one of the most effective techniques you can try, and you should probably try it first.”

Expert

20 studies (ie, published from 1981 to 2017) used guided imagery in selected and unselected samples. The targets (eg, stress and performance anxiety) and the theoretical framework (eg, mindfulness, biofeedback, and psychodynamic psychotherapy) were diverse. Guided imagery was only a small component of nine studies^{44,49,51,54,57,58,62–64} making conclusions about the role that imagery has difficult. Four studies used imagery for performance anxiety (eg, for musicians, nurses administering injections, and athletes) with mixed results.^{46,48,55,61} Overall, evidence of efficacy for reducing anxiety or depression is scarce,^{45,47,52,53} especially compared with control

groups.^{50,56,60} One study in 15 adolescents appeared to show efficacious treatment of post-traumatic symptoms (anxiety scores pre–post, $d=-0.74$)⁵⁹ by use of symbol drama, a psychotherapeutic method making use of imagery as a major tool. In summary, evidence is currently limited for guided imagery and heterogeneity across studies was high.

12 papers focused on positive imagery (ie, published from 1981 to 2020), all with moderate to large sample sizes (ie, $n>20$). Most studies focused on mood, except for two studies. One of these studies was in young people with high non-clinical paranoia⁶⁶ and showed that generating positive imagery of feeling secure and trusting (compared with suspicious and mistrusting) reduced paranoia, anxiety, and negative affect. Another study was a feasibility randomised controlled trial for young people who self-harm. This study indicated that functional imagery training (ie, by use of motivational imagery) could reduce self-harm frequency at 3-month assessment (within group, $d=0.65$).⁶⁸ Two papers aimed to enhance daydreams with mixed findings: one study noted improvement in depression⁷¹ (within-group $d=1.33$, compared with control $d=0.35$), whereas the other study showed no significant between-group differences.⁶⁹ The other four studies used unselected samples. Two delivered imagery training via the internet: imagery training for rewarding activities increased wanting rewarding

Year published	Mean age, years	Sample size, n	Participant selection	Proportion of sample who were women, n (%)	Country income level	Group or individual	Randomisation and control type	Length of intervention	Primary outcome focus	Traffic light rating of promise	
Imaginal exposure											
Berenz ¹⁵	2012	24	1	Selected diagnosis (ie, PTSD)	1 (100%)	High	Individual	Case study	Nine sessions	Trauma	Green
Brown ¹⁶	2018	22.4	59	Selected by use of questionnaire (ie, PTSD)	43 (73%)	High	Individual	Randomised groups (ie, two experimental conditions with one active control)	12 trials, trauma script on days 1 and 8	Trauma	Green
Carrigan ¹⁷	1999	Undergraduate students (ie, mean age not reported)	71	Selected diagnosis (ie, public speaking anxiety)	71 (100%)	High	Individual	Randomised (ie, two experimental conditions with two active controls)	Single 90 min session	Anxiety	Orange
Haemmerlie ¹⁸	1984	Undergraduate students (ie, mean age not reported)	80	Selected by use of questionnaire (ie, heterosocial anxiety)	0 (0%)	High	Individual	Randomised groups (ie, four experimental conditions with one passive control)	Two 50 min sessions, 2–3 days interval between sessions	Anxiety	Orange
Karpelowsky ¹⁹	2010	21	1	Selected diagnosis (ie, PTSD)	0 (0%)	Middle	Individual	Case study	22 sessions of 1.0–1.5 h, over 3 months	Trauma	Green
Post ²⁰	2017	23	1	Selected by use of questionnaire (ie, trauma)	1 (100%)	High	Individual	Case study	30–45 min sessions	Trauma	Green
Systematic desensitisation											
Connor-Greene ²¹	1993	19	1	Selected diagnosis (ie, anxiety)	1 (100%)	High	Individual	Case study	Nine sessions	Depression and anxiety	Green
Hekmat ²²	1985	Undergraduate students (ie, mean age not reported)	30	Selected diagnosis (ie, public speaking anxiety)	21 (70%)	High	Individual	Randomised groups (ie, one experimental condition with one active and one passive control)	Three sessions, 4-week follow-up	Anxiety	Green
Kuhlman ²³	1982	23	1	Selected diagnosis (ie, test anxiety)	0 (0%)	High	Individual	Case study	16 sessions	Trauma	Green
Meichenbaum ²⁴	1972	17–25*	21	Selected by use of questionnaire (ie, test anxiety)	6 (29%)	High	Group	Randomised groups (ie, two experimental conditions with one active and one passive control)	Eight 1 h sessions, once per week	Anxiety	Green
Persons ²⁵	1986	20	1	Selected diagnosis (ie, anxiety)	1 (100%)	High	Individual	Case study	16 sessions	Anxiety	Green
Saigh ²⁶	1989	14	1	Selected diagnosis (ie, PTSD)	0 (0%)	High	Individual	Case study	Multiple 80 min sessions	Trauma	Green
Saigh ²⁷	1987	14	1	Selected diagnosis (ie, PTSD)	0 (0%)	High	Individual	Case study	Multiple 80 min sessions	Trauma	Green
Hypnosis											
Baker ²⁸	2001	16	1	Selected diagnosis (ie, general anxiety disorder)	1 (100%)	High	Individual	Case study	Eight sessions	Anxiety	Red
Boutin ²⁹	1983	20	60	Unselected	60 (100%)	High	Individual	Randomised groups (ie, two experimental conditions with one active and one passive control)	Single session, 1-week and 8-week follow-up	Anxiety	Green
Gravitz ³⁰	1994	22	1	Selected diagnosis (ie, depression)	1 (100%)	High	Individual	Case study	One 2 h session	Depression	Green
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Year published	Mean age, years	Sample size, n	Participant selection	Proportion of sample who were women, n (%)	Country income level	Group or individual	Randomisation and control type	Length of intervention	Primary outcome focus	Traffic light rating of promise
(Continued from previous page)										
Malon ³¹	21	1	Selected diagnosis (ie, PTSD)	1 (100%)	High	Individual	Case study	Multiple treatment sessions	Trauma	Green
Payne ³²	Undergraduate students (ie, mean age not reported)	12	Unselected	6 (50%)	High	Group	Non-randomised one-arm pre-post study	Weekly 2 h sessions, over 5 weeks	Depression and anxiety	Green
Taylor ³³	18	1	Selected diagnosis (ie, anxiety)	1 (100%)	High	Individual	Case study	Multiple treatment sessions	Anxiety	Green
Tosti ³⁴	21	1	Selected diagnosis (ie, anxiety)	1 (100%)	High	Individual	Case study	Weekly 1 h session, over 10 weeks	Anxiety	Green
Yarnell ³⁵	22	1	Selected diagnosis (ie, SAD)	0 (0%)	High	Individual	Case study	Nine 1 h sessions	Anxiety	Green
Imagery rescripting										
Çili ³⁶	22.05	20	Unselected	19 (95%)	High	Individual	Non-randomised one-arm pre-post study	Three 30 min sessions, with a 1-week interval between sessions	Affect	Green
Lee ³⁷	23.92	23	Selected diagnosis (ie, SAD or trauma)	14 (61%)	High	Individual	Randomised groups (ie, one experimental condition with one active control)	Three 1-2 h sessions	Anxiety	Green
Maier ³⁸	23.11	9	Selected by use of questionnaire (ie, test anxiety)	6 (67%)	High	Individual	Non-randomised one-arm pre-post study	Two sessions, over 2 weeks	Test anxiety	Green
Norton ³⁹	20.83	60	Selected diagnosis (ie, SAD)	51 (85%)	High	Individual	Randomised groups (ie, two experimental conditions with one active control)	Weekly 30-40 min sessions, over 3 weeks	Anxiety	Orange
Prerost ⁴⁰	16	1	Selected diagnosis (ie, depression)	1 (100%)	High	Individual	Case study	19 sessions	Anxiety	Green
Reimer ⁴¹	19.52	25	Selected by use of questionnaire (ie, social phobia)	15 (60%)	High	Individual	Randomised groups (ie, one experimental condition with one passive control)	Single session	Depression and anxiety	Green
Strohm ⁴²	22.65	65	Selected by use of questionnaire (ie, negative or distressing life event)	53 (82%)	High	Individual	Randomised groups (ie, one experimental condition with one active control)	Two sessions, with a 1-week interval between sessions	Affect	Green
Waldron ⁴³	16	1	Selected diagnosis (ie, SAD, panic, and agoraphobia)	1 (100%)	High	Individual	Case study	15 sessions, over 2 months	Depression and anxiety	Green
Guided imagery										
Aritzeta ⁴⁴	19.5	233	Unselected	182 (78%)	High	Individual	Controlled pre-post study (one active condition with one passive control)	3 months	Anxiety	Green
Charette ⁴⁵	15	40	Selected (ie, postoperative)	33 (83%)	High	Individual	Randomised (ie, one experimental condition with one active control)	1 month	Anxiety	Orange
(Table continues on next page)										

Year published	Mean age, years	Sample size, n	Participant selection	Proportion of sample who were women, n (%)	Country income level	Group or individual	Randomisation and control type	Length of intervention	Primary outcome focus	Traffic light rating of promise
(Continued from previous page)										
Coelho ⁴⁶	17	49	Unselected	0 (0%)	Middle	Individual	Matched randomised groups (ie, one experimental condition with one active control)	Three 25 min sessions per week, over 9 weeks	Anxiety	Green
Cohen ⁴⁷	Undergraduate students (ie, mean age not reported)	40	Unselected	..	High	Individual	Matched randomised groups (ie, two active conditions with one passive control)	Eight sessions, over 4 weeks	Affect	Orange
Esplen ⁴⁸	23.8	21	Unselected	12 (57%)	High	Individual	Non-randomised one-arm pre-post study	10 min per day, over 1 week	Anxiety	Green
Hazaleus ⁴⁹	Undergraduate students (ie, mean age not reported)	60	Selected diagnosis (ie, anxiety)	29 (48%)	High	Group	Randomised groups (ie, two active conditions with one passive control)	Six 1 h sessions, once per week	Anxiety	Orange
Iglesias ⁵⁰	24	52	Unselected	39 (75%)	High	Individual	Randomised groups (ie, three active conditions)	90–120 min sessions, over 10 weeks	Affect	Green
Iglesias ⁵¹	Undergraduate students (ie, mean age not reported)	89†	Unselected	..	High	Individual	Randomised groups (ie, one experimental condition with one passive control)	Single session	Anxiety	Orange
Jallo ⁵²	24–26	72	Unselected	72 (100%)	High	Individual	Randomised groups (ie, one experimental condition with one passive control)	Four 20 min practice sessions, over 12 weeks	Anxiety	Orange
Jallo ⁵³	24–38	30	Unselected	30 (100%)	High	Individual	Non-randomised one-arm pre-post study	Daily, for 12 weeks	Anxiety	Green
Jennings ⁵⁴	17–18*	5	Unselected	..	High	Individual	Non-randomised one-arm pre-post study	Four 50 min sessions, over 3 weeks	Anxiety	Green
Kim ⁵⁵	20	30	Selected by use of questionnaire (ie, anxiety)	30 (100%)	High	Individual	Randomised groups (ie, two active conditions)	Weekly sessions, over 6 weeks	Anxiety	Orange
Kingston ⁵⁶	23	42	Unselected	33 (79%)	High	Individual	Randomised groups (ie, two active conditions)	Two 1 h sessions	Affect	Orange
Kraemer ⁵⁷	23–65	52	Unselected	33 (63%)	High	Group	Controlled pre-post study (ie, one active condition with one passive control)	2 h sessions, over 11 weeks	Affect	Green
McKenna ⁵⁸	16.1	66	Selected by use of questionnaire (ie, anxiety)	43 (65%)	High	Individual	Non-randomised one-arm pre-post study	45 min sessions	Anxiety	Green
Nilsson ⁵⁹	15.6	15	Selected diagnosis (ie, PTSD)	13 (87%)	High	Individual	Controlled pre-post study (ie, one active condition, one passive control)	10–35 sessions	Trauma	Green
Schandler ⁶⁰	21.3	45	Selected by use of questionnaire (ie, anxiety)	..	High	Individual	Randomised groups (ie, two active conditions)	Weekly sessions, over 3 weeks	Anxiety	Green
Speck ⁶¹	Undergraduate students (ie, mean age not reported)	26	Unselected	26 (100%)	High	Individual	Randomised groups (ie, one experimental condition with one passive control)	Single session	Anxiety	Orange

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Year published	Mean age, years	Sample size, n	Participant selection	Proportion of sample who were women, n (%)	Country income level	Group or individual	Randomisation and control type	Length of intervention	Primary outcome focus	Traffic light rating of promise
(Continued from previous page)										
Tien ⁶²	2014	16	1	Selected diagnosis (ie, anxiety)	High	Individual	Case study	10 months	Anxiety	Green
Wilson ⁶³	2015	15.8	102	Unselected	High	Group	Non-randomised one-arm pre-post study	Weekly 30 min sessions, over 6–8 weeks	Anxiety	Green
Yahav ⁶⁴	2008	14.6	255	Unselected	High	Group	Controlled pre-post study (ie, two populations form two active conditions and two passive controls for a total of four groups)	Weekly 1 h sessions, over 8 weeks	Anxiety	Green
Enhancing positive imagery										
Black ⁶⁵	2016	22.51	137	Selected by use of questionnaire (ie, obsessive compulsive disorder)	High	Individual	Randomised groups (ie, two experimental conditions with two active control)	Single session, 1-week follow-up	Anxiety	Orange
Bullock ⁶⁶	2016	20.9	30	Selected by use of questionnaire (ie, paranoia)	High	Individual	Randomised groups (ie, two active conditions)	Single session	Anxiety	Green
De Voogd ⁶⁷	2017	15.68	119	Selected by use of questionnaire (ie, anxiety or depression)	High	Group	Randomised groups (ie, two experimental conditions with one active control)	4-week training	Depression and anxiety	Orange
Di Simplicio ⁶⁸	2020	19.45	38	Selected (ie, self-harm)	High	Individual	Randomised groups (ie, one active condition with one delayed intervention control)	Two 90 min sessions plus five 15–30 min support calls over 8 weeks	Self-harm	Green
Gold ⁶⁹	1981	Undergraduate students (ie, mean age not reported)	30	Selected by use of questionnaire (ie, depression)	High	Individual	Randomised groups (ie, two experimental conditions with one passive control)	Two sessions	Depression	Orange
Holden ⁷⁰	2017	24.23	231	Unselected	High	Individual	Non-randomised one-arm pre-post study	45 min single session, with 2-week follow-up	Affect	Green
Jarvinen ⁷¹	1981	Undergraduate students (ie, mean age not reported)	53	Selected diagnosis (ie, depression)	High	Individual	Randomised groups (ie, two experimental conditions with one active and one passive control)	4 weeks	Depression	Green
Linke ⁷²	2017	23.8	30	Unselected	High	Individual	Randomised groups (ie, one experimental condition with one passive control)	Eight 15 min training sessions, over 2 weeks	Affect	Green
Meevisse ⁷³	2011	23.5	54	Unselected	High	Individual	Randomised groups (ie, one experimental condition with one active control)	Single session, with 2-week follow-up	Affect	Green
Murphy ⁷⁴	2011	19.8	20	Unselected	High	Individual	Single session experimental pre-post study with two counterbalanced task orders	Single session	Affect	Green
(Table continues on next page)										

Year published	Mean age, years	Sample size, n	Participant selection	Proportion of sample who were women, n (%)	Country income level	Group or individual	Randomisation and control type	Length of intervention	Primary outcome focus	Traffic light rating of promise	
(Continued from previous page)											
Renner ²⁵	2014	22.1	40	Unselected	32 (80%)	High	Individual	Randomised groups (ie, one experimental condition with one active control)	Affect	Green	
Rohrbacher ²⁶	2014	22	52	Selected by use of questionnaire (ie, depression)	40 (77%)	High	Individual	Randomised groups (ie, two experimental conditions with one passive control)	Anxiety	Orange	
Imagery-enhanced protocols											
McEvoy ²⁷	2018	22.87	46	Selected diagnosis (ie, SAD)	25 (54%)	High	Group	Non-randomised one-arm pre-post study	12 2 h sessions, once per week, with 1-month follow-up	Anxiety	Green
Pile ¹²	2020	16.95	9	Selected by use of questionnaire (ie, mood)	6 (67%)	High	Individual	Case series	Four 90 min sessions, with 3-month follow-up	Depression	Green
Reardon ²⁸	1977	16	32	Selected by use of questionnaire (ie, conduct problems)	32 (100%)	High	Individual	Randomised groups (ie, two experimental conditions with one active control)	Six 1 h sessions, over 6 weeks	Affect	Green
Skodzik ²⁹	2017	21.78	71	Selected by use of questionnaire (ie, state or trait worry)	60 (85%)	High	Individual	Randomised groups (ie, one experimental condition with one passive control)	Single session, 7 days home practice, 4-week follow-up	Anxiety	Green
Factors influencing effectiveness											
Birtel ³⁰	2012	21.14	29	Unselected	25 (86%)	High	Individual	Randomised groups (ie, two active conditions)	Single session	Anxiety	Green
Birtel ³⁰	2012	19.59	32	Unselected	0 (0%)	High	Individual	Randomised groups (ie, two active conditions)	Single session	Anxiety	Green
Gilbert ³¹	2007	23.39	197	Unselected	171 (87%)	High	Group	Non-randomised one-arm pre-post study	Single session	Depression	Green
Hart ³²	1985	Undergraduate students (ie, mean age not reported)	56	Unselected	..	High	Individual	Randomised groups (ie, two active conditions)	Single session	Depression	Green
Holmes ³³	2008	21.42	78	Unselected	41 (53%)	High	Individual	Randomised groups (ie, two active conditions with one active control)	Single session	Affect	Green
Hopf ³⁴	1992	19.7	88	Selected by use of questionnaire (ie, social anxiety)	47 (53%)	High	Group	Randomised groups (ie, six active conditions, one control)	Three 2 h sessions	Anxiety	Green
Johnsen ³⁵	2001	20.25	172	Unselected	131 (76%)	High	Group	Randomised groups (ie, two active conditions)	Two sessions	Affect	Green
Means ³⁶	1987	Undergraduate students (ie, mean age not reported)	32	Unselected	..	High	Individual	Randomised groups (ie, two active conditions with two counterbalanced treatment orders)	Single session	Affect	Green
Propst ²⁷	1980	Undergraduate students (ie, mean age not reported)	300	Selected by use of questionnaire (ie, depression)	..	High	Individual	Randomised groups (ie, two active conditions with one active and one passive control)	Six sessions	Depression	Green
(Table continues on next page)											

Year published	Mean age, years	Sample size, n	Participant selection	Proportion of sample who were women, n (%)	Country income level	Group or individual	Randomisation and control type	Length of intervention	Primary outcome focus	Traffic light rating of promise
(Continued from previous page)										
Richardson ⁸⁸	1982	Undergraduate students (ie, mean age not reported)	66	Unselected	0 (0%)	High	Individual	Non-randomised one-arm pre-post study with four organic groups	Affect	Green
Selcuk ⁸⁹	2012	20	123	Unselected	105 (85%)	High	Individual	Randomised groups (ie, one active condition with one active control)	Affect	Green
Thompson ⁹⁰	2010	22.1	35	Unselected	28 (80%)	High	Individual	Randomised groups (ie, two active conditions with one active control)	Affect	Orange
White ⁹⁰	2019	20.08	911	Unselected	556 (61%)	High	Individual	Randomised groups (ie, two active conditions)	Affect	Green
Wong ⁹¹	2020	19.57	112	Selected by use of questionnaire (obsessive compulsive disorder)	69 (62%)	High	Individual	Randomised groups (ie, two active conditions)	Affect	Green
Insights into mechanisms underlying change										
Catanese ⁹³	1979	Undergraduate students (ie, mean age not reported)	120	Selected by use of questionnaire (ie, depression)	88 (73%)	High	Group	Randomised groups (ie, four experimental conditions with one active control)	Depression	Green
Dorfan ⁹⁴	2006	21.7	90	Unselected	65 (72%)	High	Individual	Randomised groups (ie, two active conditions with one active control)	Anxiety	Green
Nelis ⁹⁵	2012	19.47	78	Unselected	71 (91%)	High	Individual	Randomised groups (ie, two experimental conditions with one active control)	Affect	Green
Rijkeboer ⁹⁶	2020	23.08	127	Unselected	83 (65%)	High	Individual	Randomised groups (ie, three active conditions with one active control)	Trauma	Orange
Tolgou ⁹⁷	2017	22.43	159	Selected by use of questionnaire (ie, health anxiety)	137 (86%)	High	Individual	Randomised groups (ie, three active conditions with one passive control)	Anxiety	Green
Warren ⁹⁸	1984	Undergraduate students (ie, mean age not reported)	59	Unselected	..	High	Group	Randomised groups (ie, two experimental conditions with one passive control)	Anxiety	Orange
Watson ⁹⁹	2016	18.39	135	Unselected	111 (82%)	High	Individual	Randomised groups (ie, three active conditions)	Affect	Green
Selected by use of questionnaire refers to participants that were selected on the basis of questionnaire psychometric scores. Selected diagnosis refers to participants that were selected on the basis of clinical diagnosis. Birtel and colleagues is listed twice due to the use of two groups. PTSD=post-traumatic stress disorder. SAD=social anxiety disorder. *Reported age range only. †10 participants in stress management programme and 79 participants assigned to waitlist.										
Table: List of individual studies										

stimuli, reward sensitivity, and reduced depression (pre-post $d=0.67$; between group $d=0.53$);⁷² savouring a positive social memory (within group design) enhanced positive affect⁷⁰ immediately following intervention but not at 2-week follow-up. Two other brief intervention studies used best-possible-self-imagery to enhance positive affect. First, a 2-week intervention enhanced positive affect ($d=1.02$), compared with a control ($d=1.13$).⁷³ Second, a single session design replicated these findings and showed that best-possible self-imagery could reinstate positive affect following a sad mood induction.⁷⁵

The other four studies used imagery to enhance cognitive bias modification of interpretations (ie, Internet-Based Cognitive-Bias Modification programme) in samples selected for depression,⁷⁶ compulsive checking,⁶⁵ and anxiety and depression⁶⁷ and an unselected sample.⁷⁴ The techniques used (eg, self-generated imagery) did not significantly improve effects.^{65,67,76} Subjective evaluation was also negative in the adolescent study.⁶⁷ A fourth smaller study trained participants to use EMI to interrelate videos of themselves completing ambiguous tasks with negative or positive captions.⁷⁴ This study showed improvement in positive mood ($d=0.89$) and decrease in sad mood ($d=0.55$).

In summary, enhancing positive imagery by use of brief interventions could be helpful for a range of targets (including reward sensitivity and positive affect). However, most studies were in unselected populations. There is no evidence that imagery enhances the effects of Internet-Based Cognitive-Bias Modification in young people.

Four studies (ie, published from 1977 to 2020) used imagery-enhanced protocols (where imagery was embedded throughout the intervention protocol). One study showed that rational stage directed imagery was more efficacious for reducing depression than was a rational (ie, cognitive) restructuring treatment.⁷⁸ One paper investigated group delivery of imagery-enhanced cognitive behavioural therapy for social anxiety in young people.⁷⁷ Previous trials showed that imagery-enhanced cognitive behavioural therapy was efficacious in adults, and this study showed transportability of findings and effective delivery by trainee clinicians. With colleagues, we have developed an intervention (ie, integrating memories and generating new experiences, also known as IMAGINE) that combines imagery rescripting for aversive memories with positive future imagery generation for adolescents with depression.^{12,100} Our previous case series showed large decreases in depression ($d=1.32$) and anxiety ($d=1.15$), which were maintained at 3-month follow-up (depression $d=1.46$, anxiety $d=1.67$). The final study trained high worriers ($n=71$) to generate vivid, detailed, and emotionally laden mental images of positive and negative future situations in their everyday lives.⁷⁹ This training reduced anxiety compared with a waitlist control intervention ($d=0.55$). In summary, the four studies used different approaches,

but integrating imagery in different ways throughout the treatment protocol might produce reductions in anxiety or depression, or both.

Factors influencing effectiveness

The context of harnessing emotional mental imagery is important for its effectiveness. Studies suggest that imagery techniques preceding other intervention components can be beneficial. In a study looking at the sequencing of treatment components (ie, visualisation, systematic desensitisation, and skills training) for public speaking anxiety, only when the intervention began with visualisation or systematic desensitisation (and not skills training), was the intervention significantly better than no intervention at reducing trait and state anxiety, negative thoughts, and behavioural manifestations of speech anxiety.⁸⁴ Efficacy of alleviating unpleasant moods was enhanced when brief imagery techniques were used before brief cognitive techniques.⁸⁶ Similarly, when dysphoria was induced by use of cognitive or imagery approaches, cognitive techniques reduced cognitively induced dysphoria, whereas imagery techniques reduced both types of dysphoria.⁸² These studies suggest that imagery might facilitate the effectiveness of cognitive approaches but not vice versa, and imagery could be an important part of a combination treatment approach.¹⁰¹

An experimental study suggested the importance of activating the fear network with negative imagery before presenting positive imagery, in the context of reducing prejudice against stigmatised groups (eg, adults with schizophrenia, gay men, and British Muslims).⁸⁰ Imagining a single negative encounter before a positive encounter significantly reduced anxiety and increased intentions to engage positively with the stigmatised group, compared with imagining two positive encounters. Further, generating a supportive image was more efficacious when generated after recalling a negative memory, compared with generating it before recall.⁸⁹

Individually tailoring imagery appears to be important. One large study ($n=300$) showed that religious imagery reduced depression significantly more than non-religious imagery in religious people.⁸⁷ Use of the image of an attachment figure, compared with an acquaintance, was also significantly more efficacious in recovering from negative affect that was triggered by recalling an upsetting memory.⁸⁹ Our experts emphasised that self-generated content (compared with being asked to imagine something) could be important:

“For imagery directed at anxiety, such as of catastrophic future outcomes or the self being humiliated or killed, it is more necessary for those images to be internally generated as they are more idiosyncratic [compared with imagery linked to performance].”

Expert

“Someone planting an image in your head is not the same as having the thought yourself. It is not just that

the image is there, it is also how it got there that is important.”

Expert

Individual differences can affect the effectiveness of harnessing EMI. Imagery ability (eg, the extent to which an individual can generate vivid images and absorb themselves into their content) might adjust intervention response and affect the ease and clarity of visualisations. For example, high imagers (ie, defined by score on the Creative Imagination Scale) compared with low imagers were more vulnerable to stress that was induced by an unpleasant movie scene, but also benefited more from relaxation intervention.⁸⁵ Another study suggested that greater mood changes can be induced in high imagers compared with low imagers.⁸⁸ However, our LERs all identified vivid imagery and our experts suggested that, with the right training and tools, imagery could be effectively harnessed for everyone.

“Not being a strong visualiser has never been a limiting factor, it just changes the way you work with them.”

Expert

One suggested approach to enhance ability to visualise is virtual reality. One study showed enhanced engagement in EMI with virtual reality, but (perhaps due to small sample size or absence of self-generated imagery) this engagement did not translate into benefits for mood.⁹⁰

Trait differences can affect image generation. Self-criticism was associated with ease and clarity in generating hostile self-critical images, whereas self-reassurance was associated with ease and clarity in generating warm and supportive images.⁸¹ In this study, difficulty generating compassionate images contributed to depressive symptoms, which was reflected in our consultations with LERs.

“It is hard to think of the past because I’m judgemental of myself. It’s hard to imagine myself being compassionate because it’s not what I’m used to.”

Woman, aged 24 years, White British

Imagery from a field perspective (ie, through our own eyes) compared with an observer perspective (ie, looking at ourselves) can increase emotional intensity. A study in undergraduates with many symptoms of obsessive compulsive disorder supports the causal relationship between adopting an observer perspective for a negative intrusive image and reduction in distress (within group $d=0.57$; between group $d=0.65$).⁹² For future negative experiences that are anxiety provoking, adopting a self-distanced perspective also lowered distress, anxiety, and imagery vividness.⁹¹ Authors also showed that self-distancing led to higher amounts of reconstrual thoughts (ie, finding insight and closure) relative to recounting thoughts (ie, what happened and how this felt) and improved self-efficacy. Similarly, a field perspective for positive imagery has been shown to increase positive

affect⁸³ compared with observer imagery ($d=0.47$) or a verbal condition ($d=0.64$). However, one study noted no difference between observer and field perspectives.⁹⁵

Why does EMI work? Insights into mechanisms underlying change

EMI interventions can work by generating images that form powerful mental evidence; reducing the effects and intrusive nature of negative images; and enhancing positive images to increase engagement in life. Experimental studies emphasise the power of EMI. One study with a contamination stimulus noted that moving harm imagery (ie, a stimulus containing germs or contaminants that are moving) sensitises distress during a 30 min exposure to a contaminant, whereas static harm (ie, a stimulus containing germs or contaminants that are not moving) or safety imagery (ie, a stimulus that does not contain germs or contaminants) reduced distress.⁹⁴ Participants viewing moving harm imagery did not merely show slower distress reduction than participants viewing static harm or safety imagery, rather they sensitised, increasing distress over time and having increased threatening cognitions. Another study reported no difference in use of imagery or an activity in response to low mood in daily life. This study suggested that, for mood, imagery could be as powerful as actually engaging in activities.⁹³

Imagery techniques can reduce the power of distressing negative images (ie, past and future) through reducing avoidance, enabling emotional processing, updating their meaning or content, or a combination. Imagery rescripting can ensure emotional processing without emotionally overwhelming young people. For example, one study compared participants who underwent one of three 9 min imagery techniques (ie, positive imagery, imagery re-experiencing, and imagery rescripting) with a control group who did not use any techniques following an aversive film.⁹⁷ Participants were selected for high health anxiety. Imagery rescripting led to greater increases in heart rate than did positive imagery and greater decreases in heart rate than did imagery re-experiencing (but these differences were not statistically significant). Directly after the interventions, distress was decreased in all conditions except for the imagery re-experiencing group, and by follow-up, imagery rescripting provided more benefit than positive imagery in terms of mood and distress. These results mirror suggestions that exposure therapy can be a stressful intervention with high dropout rates and that the use of positive images for intrusive aversive memories can represent another form of avoidance. A study that compared rescripts of forgiveness, avoidance, or revenge for a bullying episode ($n=135$, unselected sample) noted that both avoidance and forgiveness decreased negative affect, but forgiveness was more stressful than the other conditions.⁹⁹ These results might indicate advantages of avoidance for stress reduction in

the short term, but in the long term, forgiveness might be more helpful. However, one study using the trauma film paradigm reported no advantage of imagery over writing to rescript the film,⁹⁶ and another study showed no advantage of adding imagery to rational emotive therapy.⁹⁸ LERs emphasised that people often tell them to avoid negative imagery and that this is unhelpful.

“Distractions only help in the short term because they don’t stop [negative images] coming back.”

Woman, aged 17 years, White British

Experimental studies showed that imagining positive events (compared with verbal processing)⁹⁵ is more powerful for increasing positive affect, and enhancing positive future imagery can increase motivation and reward sensitivity⁷² and protect against low mood.⁷⁵ Our consultations also suggested that positive future imagery could disrupt worry and increase positive approach behaviour.

“I stopped worrying about all the things that happened in the past. Positive images were coming in my mind and I was able to come out of that phase...giving me energy, asking me to explore...”

Man, aged 24 years, Asian British

“Your future is a trajectory with things dotted in that trajectory that pull you forward, get you out of bed, get you engaged, get you active. If you lose sight of those things, you haven’t got that pull, you haven’t got that engagement... When people are suicidal, their future trajectory has been disrupted and cut off.”

Expert

One factor that was emphasised in the consultations (but not covered in the literature) is whether it is important to address negative imagery first, before positive imagery can be harnessed.

“If a future negative thing is quite aversive then people might switch off from thinking about the future. You can’t just keep positive things intact, everything is dampened down.”

Expert

“I don’t really get positive images of the future. I usually get negative images that are informed by past experiences. I’m starting University in September and I get images of not making friends, like when I was at boarding school.”

Man, aged 19 years, White British

Discussion

Harnessing EMI to reduce anxiety and depression appears promising, with most intervention studies showing positive findings. Interventions with imagery rescripting for aversive memories, positive imagery, and imagery-enhanced protocols indicated the most potential. EMI interventions might work by generating images that can form powerful mental evidence; reducing the effects and intrusive nature of aversive memories; and

enhancing motivating positive images that can protect against low mood and increase engagement in life.

Imagery rescripting had the strongest evidence base, with the largest number of randomised controlled trials evaluating a similar approach. This evidence base is consistent with large effect sizes that were identified in a meta-analysis in adults.¹¹ Imagery rescripting can be particularly powerful as it targets a key maintaining factor for anxiety or depression. However, in the studies included in our systematic review, imagery rescripting was mostly applied to anxiety and the mean sample age was usually 18–24 years. Our previous case series¹² (using the intervention integrating memories and generating new experiences) applied imagery rescripting to depression in people younger than 18 years and combined imagery rescripting with enhancing positive imagery. This case series showed promising decreases in anxiety and depression. Interventions enhancing positive imagery mostly focused on improving mood in unselected samples with brief interventions; initial results were promising and evaluation in clinical samples is needed.

Contextual factors appear to be important for intervention design (eg, ordering of intervention components and tailoring content) and individual formulation to maximise effects (eg, people who struggle to generate compassionate imagery might benefit from additional scaffolding, such as help to generate the imagery). Metacognitive approaches, such as changing perspective (eg, observer *vs* field), can also influence the emotional power of imagery. Consultations suggested that simply becoming aware of the effects that EMI has on mood and behaviour could enhance understanding and empower young people to use EMI in more helpful ways. This awareness could be important to explore in EMI research, with the potential to develop brief scalable interventions. Imagery mostly outdid or was equivalent to its verbal counterparts, replicating previous work in adults. However, it is perhaps unhelpful to view imagery as being in competition with verbal techniques. It seems probable that they operate via different mechanisms with slightly different outcomes and might be used together to boost treatment effectiveness.

In terms of measuring imagery, intrusion frequency and distress were included in some studies (eg, as a symptom measure). However, most intervention studies did not measure change in imagery vividness or other components of imagery experience, which most likely reflects the scarcity of available validated measures.

In the future, mental health science could helpfully address two outstanding questions. First, whether it is important to target negative intrusive imagery before use of other techniques. An important insight from our consultation is that, by not emotionally processing (eg, avoiding) negative images, positive memories and future images could be less accessible and more constrained by past events than if negative images are processed. A second outstanding question is whether

adding a positive imagery intervention, for example to imagery rescripting, could enhance effects and protect against relapse. This addition could be particularly important for people with depression, where anhedonia predicts poor treatment response and relapse. By processing and contextualising negative intrusive imagery, accessing positive imagery might be possible, which techniques can then helpfully enhance.

Consultation suggested that EMI is often absent in interventions, yet imagery techniques could be readily incorporated into routine care. Protocol-driven imagery interventions tend to be briefer and are likely to be more transportable,⁷⁷ with the potential for low-cost scalability and delivery by non-specialist practitioners. One suggestion as to why imagery techniques are not used by practitioners is due to safety concerns. We did not identify any evidence that imagery techniques were associated with harm in this Series paper. Clinicians could consider techniques to reduce negative imagery and those to build positive future images. Individual tailoring and self-generated imagery could be important, for example to understand beliefs that maintain distressing imagery (eg, an LER stated that “if I can see it, it must be real”). Harnessing EMI might not only enable us to reduce the anguish that is associated with negative intrusive imagery but also allow us to re-engage and motivate young people towards a positive future.

Contributors

VP, EAH, and JYFL contributed to the conceptualisation of the study and the methods. VP, GW, and AS completed the systematic review and data synthesis. VP and GW completed the consultation with young people with lived experience and experts. All authors contributed to the interpretation of the results. VP drafted the manuscript. GW, AS, EAH, and JYFL contributed to the writing and editing of the manuscript. All authors approved the final version for submission.

Declaration of interests

VP reports funding from National Institute for Health Research, Wellcome Trust, Emerging Minds UK Research and Innovation, and Mental Health Research UK. EAH reports serving on the board of trustees of the charity MQ: Transforming Mental Health, but receives no remuneration for this role. EAH receives royalties from books and occasional fees for workshops and invited addresses and reports grants from the Oak Foundation, the Lupina Foundation, and the Swedish Research Council. EAH reports serving on the Editorial Advisory Board of The Lancet Psychiatry. JYFL reports four other projects commissioned by the Wellcome Trust, outside the submitted work. She also reports other current funding from the UK Economic and Social Research Council, Barts Charity, British Academy, and Mental Health Research UK and receives occasional fees for workshops and invited addresses. GW and AS declare no competing interests.

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