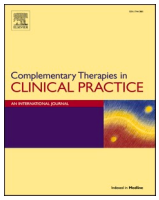
Complementary Therapies in Clinical Practice 52 (2023) 101776

Contents lists available at ScienceDirect

Complementary Therapies in Clinical Practice

journal homepage: www.elsevier.com/locate/ctcp



Demystifying hypnosis: Unravelling facts, exploring the historical roots of myths, and discerning what is hypnosis

Dali Geagea [a,*], David Ogez [b], Roy Kimble [c], Zephanie Tyack [a,d]

[a] Child Health Research Centre, Centre for Children's Burns and Trauma Research, The University of Queensland, Brisbane, Australia
[b] Department of Anaesthesiology and Pain Medicine, University of Montreal, Montreal, Canada
[c] Centre for Children's Burns and Trauma Research, Queensland Children's Hospital, The University of Queensland, Brisbane, Australia
[d] Australian Centre for Health Service Innovation and Centre for Healthcare Transformation, School of Public Health and Social Work, Queensland University of Technology, Brisbane, Australia

ARTICLE INFO

Keywords:
Hypnosis
Myths
Misconceptions
Facts
History

ABSTRACT

Background and purpose: Hypnosis, a mind-body treatment dating back to early human history, has regained attention in the last decade, with research suggesting its effectiveness for varied physiological and psychological ailments such as distress, pain, and psychosomatic disorders. However, myths and misconceptions have prevailed among the general public and clinicians, hindering the adoption and acceptance of hypnosis. It is important to distinguish myths from facts and discern what is hypnosis and what is not to enhance the understanding, acceptance, and adoption of hypnotic interventions.
Methods: This narrative review traces the history of myths surrounding hypnosis in contrast to the evolution of hypnosis as a treatment modality. In addition to comparing hypnosis to other interventions with similar procedures and features, the review unravels misconceptions that have impeded the adoption and acceptance of hypnosis in clinical and research settings and presents evidence to demystify this intervention.
Results: This review examines the roots of myths while presenting historical facts and evidence that support hypnosis as a treatment modality and alleviate misconceptions depicting it as mystical. Further, the review distinguishes hypnotic and non-hypnotic interventions with overlapping procedures and phenomenological features to enhance our understanding of hypnotic techniques and phenomena.
Conclusion: This review enhances the understanding of hypnosis in historical, clinical, and research contexts by disproving related myths and misconceptions to promote the adoption of hypnosis in clinical and research contexts. Further, this review highlights knowledge gaps requiring further investigations to steer research towards an evidence-based practice of hypnosis and optimise multimodal therapies embedding hypnosis.

1. Introduction

Hypnosis is a mind-body intervention with a long history of use for varied physical and psychological conditions [1,2]. The surge in research in the last four decades has supported using hypnosis for various physiological and psychological ailments, including pain, distress, and psychosomatic disorders [3–10]. Hypnosis can be tailored to diverse settings and populations and delivered in varied modes (recorded or live) and durations, without requiring the presence of providers (e.g., self-hypnosis) nor high technical requirements [4,11]. This emerging research supporting the effectiveness and applicability of hypnosis in medical and psychotherapeutic settings has promoted the acceptance of hypnosis as a treatment modality [2,4,11–13].

Despite the compelling evidence base supporting hypnosis, its adoption in medical and research settings is hindered by the prevailing myths and misconceptions that influence popular views of hypnosis [14,15]. A 2022 survey of 691 hypnosis clinicians from 31 countries found that 62 percent reported using hypnosis with half or fewer of their patients [2]. The use of hypnosis in the United states was estimated as 0.2 percent of the general population in 2007 [16], and 0.4 to 0.6 percent of cancer populations in 2008 [17,18]. A scoping review of hypnosis for children's procedural pain and distress reported high rates of attrition (52 percent) and unwillingness to participate (52 percent) [7]. Reasons for refusal to use hypnosis included parents' misconceptions that hypnosis would increase children's anxiety [19], in addition to children's lack of interest or religious reservations [20], misconceptions regarding

* Corresponding author.
E-mail address: d.geagea@uq.net.au (D. Geagea).

https://doi.org/10.1016/j.ctcp.2023.101776
Received 27 April 2023; Received in revised form 4 June 2023; Accepted 14 June 2023
Available online 22 June 2023

hypnosis [21], or finding no need for hypnotic interventions [22]. Children were reported to interrupt hypnosis due to perceived conflict with religion, feeling uncomfortable during hypnosis, insufficient motivation, or parental interference [23]. Furthermore, based on surveys, misconceptions and myths eliciting fears obstructing the use of hypnosis in clinical and research settings have persisted among the general public [11,24,25]. For instance, negative attitudes towards hypnosis displayed by American and European students were reportedly due to misinformation and misconceptions involving fears of losing control or being unconscious, in a trance, controlled by the *hypnotist*, or forced to respond [24,26,27]. Further, a survey indicated a lack of information and misconceptions regarding hypnosis among 279 adults from Brisbane, mainly due to how it is portrayed and perpetuated by the media and stage hypnosis [28].

In contrast to negative views that have impeded engagement in hypnosis, positive views are postulated to increase willingness or motivation to be hypnotised, in line with socio-cognitive theories [29–34]. In the survey of 691 clinicians who use hypnosis in 31 countries, 75 percent considered patients' attitude as essential for successful hypnosis [2]. Additionally, a study examining interests and attitudes towards hypnosis in a large community sample of 509 participants reported that the interest in receiving hypnosis was linked to positive attitudes and expectations of effectiveness [35]. A plethora of studies has also shown that participants' willingness to use hypnosis increased after being informed about this intervention [24,26,36,37]. The willingness of patients to use hypnosis appears to be favourable in medical and therapeutic contexts where adequate information is provided and treatments are delivered within a relationship of trust that encourages positive treatment expectancies. For instance, 89 percent of 115 oncology patients and 72 percent of 310 dentistry patients expressed willingness to use hypnosis [38,39]. According to a narrative review of opinions towards hypnosis, the majority of patients showed positive attitudes and an openness towards using hypnosis in medical or psychotherapy settings [40]. Therefore, providing adequate information that promotes positive views of hypnosis and dispels misconceptions (where supported by evidence) is crucial to enhance individuals' attitudes towards hypnosis and their willingness to use it.

Clinicians and the context in which suggestions are offered are also important for the acceptance and the successful use of hypnosis [30]. Clinicians play an important role in the adoption and implementation of interventions by promoting the acceptance, comfort, and engagement of patients, as well as facilitating liaison among multidisciplinary healthcare providers [41,42]. However, mixed opinions about hypnosis exist among clinicians due to their lack of information about its clinical uses [11,43]. For instance, a survey of 218 Australian anaesthetists revealed that 63 percent of them had insufficient knowledge about hypnosis [44]. Thus, there is a need to address misinformation prompting negative attitudes and misconceptions impeding clinicians' adoption of hypnosis in clinical and research settings.

Whereas the spread of myths has hindered the adoption of hypnosis by eliciting negative attitudes and fears, providing clinicians with accurate information has been shown to enhance their attitudes towards hypnosis [11,35]. Surveys have shown that clinicians with prior experience and knowledge tend to show more positive attitudes towards hypnosis [26,36,44–51]. Considering the key role of clinicians in the successful delivery and acceptance of interventions, it is crucial to provide them with evidence to dispel misconceptions and promote their adoption of hypnosis, where warranted. This narrative review aims to advance the knowledge of hypnosis amongst clinicians and the general public and thus promote its adoption and acceptance by alleviating misconceptions and discerning hypnotic and non-hypnotic interventions.

2. Unravelling the historical roots of myths and discerning facts

Common myths depicting hypnosis as trance or mesmerism, prevailing among the general public and clinicians and spread by mainstream media, originate from references to hypnosis in the 18th and 19th centuries and in state theories [14,52]. The 18th century marked the introduction of animal magnetism by the Austrian physician Franz Mesmer in 1778 [52]. Reports of the successful use of animal magnetism in treating surgical pain were met with diverse reactions of amazement, interest, rejection, and scepticism among clinicians [12]. However, investigations rejected Mesmer's claims, attributing the effects of mesmerism to a magnetic-like physical force and the *hypnotist's* power, and ascribed these effects to the imagination of hypnotised individuals [53]. Despite this, myths related to mesmerism have prevailed and were endorsed in 2006 by 79 percent of 280 students who, despite having no prior hypnotic experiences, linked the success of hypnosis to the power of the *hypnotist* (Table 1) [25]. These myths also appeared in a recent review that depicted hypnosis as involving a blind obedience to the *hypnotist's* instructions [67]. In contrast, research indicates that hypnotic responding is mainly predicted by individual variables such as hypnotic suggestibility and attitude towards hypnosis, not only due to the hypnotherapist [30]. There is also extensive evidence that hypnotic suggestibility is the primary determinant of hypnotic effects, rather than hypnotic procedures [4,56,68]. For instance, the effects of inductions on decreasing the activity of the medial prefrontal cortex were observed in individuals with high hypnotic suggestibility in contrast to those with low hypnotic suggestibility [69].

The common misconception linking hypnosis to sleep or *artificial somnambulism,* prevailing among the general public and clinicians, also stems from early references to hypnosis (Table 1) [14,52]. The term *artificial somnambulism* or sleep-like trance, referring to induced abnormal sleep in which motor acts are performed [70], was introduced in the 18th century as a predecessor of hypnosis [1]. This constituted a major shift in the conceptualisation of hypnosis and eliminated references to Mesmer and concerns over the convulsive seizures accompanying animal magnetism [71]. Although James Braid coined the term *hypnosis* in 1843, the prefix *hypno*, derived from the Greek word for sleep

Table 1
Widespread myths and empirical facts about hypnosis.

Myth	Fact
Hypnosis is a sleep-like state of somnambulism or absent peripheral awareness.	Hypnosis is distinct from sleep as hypnotised individuals remain awake and aware of their surroundings, despite being absorbed in hypnosis [54,55].
The success of hypnosis depends on the *hypnotist*.	Despite the important role of the hypnotherapist in delivering hypnosis and building rapport, hypnotic responding is primarily driven by individual variables such as hypnotic suggestibility, response expectancies, and attitude towards hypnosis [4,30,56].
Hypnosis is associated with participants' gullibility or *hypnotists'* higher influenceability.	There is a lack of association between gullibility, obedience, and social influences (e.g., hypnotherapists' authority or peer pressure) with hypnotic responding [14,57,58].
Hypnosis involves robot-like automatic responding without being able to resist suggestions.	Although hypnotic responses involve a sense of involuntariness and a reduced sense of agency [59], individuals do not lose control and may resist suggestions, that do not align with their inner inclination, during hypnosis [14,60–62].
Hypnotised individuals are unable to remember what occurs during hypnosis.	Spontaneous amnesia following hypnosis is exceptionally rare, and hypnotised individuals can remember everything that occurs during hypnosis or breach hypnotically induced amnesia when informed of the ability to do so [14, 63–66]

hypnos, was used earlier in 1820 by Hénin de Cuvillers to refer to mesmerism and animal magnetism [72]. These myths have been propagated by popular images of somnambulistic hypnotised individuals, portraying hypnosis as a state of sleep or *artificial somnambulism*, and enshrined in hypnotic inductions using suggestions for *sleep* [14]. Even modern definitions of hypnosis, such as that of the American Psychological Association, still depict hypnosis as a reduced or absent peripheral awareness [73]. Based on a survey, 62 percent of 280 students from different countries, who have never been hypnotised, stated that hypnosis directs awareness to suggestions and eliminates awareness of anything else [25]. Although hypnosis involves absorption involving focal, executive, and attentional processes of self-engagement towards the interior hypnotic experience [74–76], hypnotised individuals remain awake, aware of their surroundings, and capable of emerging from hypnosis to respond to external events [54,55]. For instance, hypnotised individuals who were able to respond to hypnotic suggestions reported awareness of independent external events [77,78].

3. Alleviating myths on hypnotic responding

Misconceptions, commonly attributed to hypnosis and linked to mesmerism, include robot-like responding and the inability to resist suggestions during hypnosis (Table 1). In the same survey mentioned previously, 44 percent of the 280 students described hypnotic responding as involuntary, robotic, and forced [25]. Depictions of hypnosis as involuntary have some truth in that hypnotic responses are characterized by a reduced sense of agency and a sense of involuntariness [59]. However, misconceptions that individuals lose control during hypnosis and cannot resist suggestions, as depicted in popular culture, are at odds with research demonstrating that participants could resist suggestions that are not in line with their inner inclination [14,60–62].

Other misconceptions surrounding hypnosis link higher responsiveness to paranormal phenomena, influenceability, gullibility, and poor mental health (Table 1). The survey including 280 undergraduates from various countries revealed that participants associated hypnosis with *hypnotists'* higher influenceability (i.e., liability to influence [79]) or individual's *mental instability* [25]. Although a meta-analysis showed that patients with dissociative (and germane) disorders exhibited higher hypnotic suggestibility, with a large effect size [80], high suggestibility has also been documented among healthy research participants without dissociative disorders [7,80]. Studies have reported a lack of association between social personality variables (e.g., social desirability, obedience, gullibility) and social influences (e.g., the *hypnotist's* authority or peer pressure) with hypnotic responding [80,81]. Further, there is insufficient evidence on the relationship between hypnotic responding and psychopathologies, paranormal phenomena, and supernatural beliefs, due to the difficulty in assessing and addressing these variables in acute clinical settings [57,58].

4. The development and use of clinical hypnosis throughout history

Although the use of hypnosis for treatment purposes goes back to early human history, the practice of medical hypnosis is typically regarded to have emerged in the 18th and 19th centuries [82]. Braid, who was among the first to establish the hypnosis vocabulary (e.g., *hypnotic, hypnotism),* proposed a physiological basis for hypnosis based on the belief that the mind is responsible for hypnotic effects [71]. Although myths linking hypnosis to sleep were based on Braid's references, he preferred the word *monoideism* to describe the focused attention experienced under hypnosis and differentiate hypnosis from sleep [71]. He was among the first surgeons to use hypnosis in medical contexts, mainly for acute pain, and induce hypnosis using eye fixation [1].

The use of hypnosis for pain emerged before developing effective pain treatments and establishing pain relief as a basic human right and well-identified social goal [12]. In the 19th century, surgeons like Jules Cloquet, John Elliotson, and James Esdaile performed hundreds of surgical procedures under hypnotic anaesthesia, with morbidity considered incredibly low at the time (40 to 45 percent). However, the discovery of inhaled anaesthetics and their increasing use during major operations hindered the use of hypnotic anaesthesia, limiting it to minor medical procedures peripheral to mainstream medicine. Further, despite the success and safety of hypnotic anaesthesia, controversy and political turmoil surrounded its use as a competitor of inhaled anaesthetics [12]. Notwithstanding the persisting marginal use of hypnotic interventions, compared to anaesthetics, the British Medical Association issued a report promoting the use of hypnosis for pain control in 1893 [12]. During the World Wars, following shortages of pharmacological treatments, the use of hypnosis for pain drastically surged on battlefields [12]. These historical facts provide evidence regarding the use of hypnosis for clinical purposes, particularly for treating pain.

The modern era of hypnosis started in the 20th century with Dr Clark Hull who conducted substantial research with his student Dr Milton Erickson in the 1930s [83]. Their research mainly focused on behavioural responses to hypnotic suggestions, cognitive-social processes underlying hypnosis, and the individual correlates of hypnotic suggestibility [84]. Erickson contributed to developing diverse therapeutic approaches and hypnotic techniques such as the hypnotherapeutic communication tool, direct suggestions, metaphors, and inductions. The Ericksonian hypnotic approach, involving indirect suggestions mixed with a psychoanalytical approach, was espoused by others, which renewed interest in medical hypnosis [1,82]. The 20th century marked the use of hypnosis in clinical and research settings, with the expansion of scientific knowledge on hypnotic analgesia, the development of hypnotic suggestibility scales, and Ericksonian hypnosis [12].

Emerging research in the 20th century shifted views surrounding pain by drawing attention to its cognitive, affective, and attentional determinants, which influenced the use of hypno-analgesia for modulating pain-related cognitions [85]. Theodore Barber's critical reviews of hypnosis for experimental pain markedly increased the interest in the hypnotic control of pain [12]. His contemporary Ernest Hilgard was among the first to study the analgesic effects of hypnotic dissociation. Hilgard's research on hypno-analgesia was viewed with divergent theoretical perspectives compared to Barber's [12]. Hilgard acknowledged that painful experiences depend not only on nociceptive stimuli but also on factors related to individuals (beliefs, expectations) and the setting [1,82,86]. Although hypnotic literature influenced cognitive-behavioural pain modulation by drawing attention to the psychological influences of pain, early pain literature rarely referred to hypnosis [12]. The relationship between cognitive and hypnotic pain control was seldom explored in the 20th century despite considerable clinical and experimental research in both domains, as suggested by literature reviews (1980-1990s, e.g., [87]), which prevented the cross-fertilisation of research efforts [12].

The 1990s witnessed the use of hypnosis for pain in more than a thousand medical procedures and surgeries [88]. The British and American Medical Associations recommended incorporating hypnosis into the medical curriculum in 1955 [12]. In 1958, the American Medical Association published a study conducted by the Council on Mental Health, suggesting potential benefits of hypnosis in medical and dental settings [12]. In 1960, the American Psychological Association recognised hypnotherapy as a division of psychotherapy and acknowledged its medical applications [12]. A statement published by the American Medical Association in 1995 and the Technology Assessment Panel of the National Institutes of Health supported hypnosis for pain and provided evidence of its utility for cancer and chronic pain [12]. However, scientific literature on hypnosis for pain and anxiety before the 20th century was predominantly based on anecdotal evidence and case reports [12]. Further, despite research advancements, the neurophenomenology of hypnotic experiences remained a source of controversy [89].

The 21st century witnessed an increased interest in hypnosis and a surge in research leading to several randomised controlled trials (RCTs)

suggesting efficacy for presurgical, intra-operative, and post-operative pain and anxiety [4,7,13,90]. Despite theoretical divergences that marked the history of hypnosis, a broad agreement emerged among researchers regarding hypnotic elements with the development of commonly accepted hypnotic practices [84,91]. Furthermore, despite exaggerated claims about the pain-alleviating effects of hypnosis, researchers and theorists have agreed that hypnosis can have clinically important effects on pain perception [12].

The development of neurophysiological techniques over the last 40 years, such as electroencephalography, shifted the focus of hypnosis research to investigating the physiological markers of hypnotic responding [3,30,92]. Systematic reviews and meta-analyses supported the effectiveness of hypnosis for chronic pain [10], tension headaches and migraines [93,94], procedural pain [4,8,87,90,95–102], immunity boosting [103], irritable bowel syndrome [104–107], and cancer-treatment side effects including nausea and vomiting [6,108]. The efficacy of hypnosis was supported for post-menopausal hot flashes in an RCT [109] and for neurodegenerative disorders, such as amyotrophic lateral sclerosis, in a longitudinal study [110]. Meta-analyses indicated the efficacy of hypnosis for obesity [111], depression [112], post-traumatic stress disorder [113], and anxiety associated with medical procedures [9,93]. Additionally, reviews offered preliminary evidence of the benefits of hypnosis for smoking cessation [114,115] and varied dermatological problems such as pruritus [5,116].

5. Distinguishing hypnotic and non-hypnotic interventions and phenomena

Hypnotic techniques can still be mis-attributed to other interventions with overlapping features and similar procedures, such as guided-imagery, relaxation, and meditation [7]. This section presents commonalities and differences between hypnosis and other interventions to enhance the understanding of core hypnotic components and phenomenological features and explore the potential benefits of combining hypnosis with other interventions (Table 2).

5.1. Hypnosis versus guided imagery, meditation, and mindfulness

Despite myths linking hypnosis to imagery, role-play, or simple compliance with suggestions, these phenomena differ from hypnosis in their neurophysiology, procedures, and mechanisms [14,66,118–123]. Hypnotic suggestions can elicit cerebral changes in correspondence with genuine perceptual experiences, indicating that hypnosis is not merely compliance with suggestions nor simple imagery [126]. Following hypnotic suggestions for altered colour perception, colour-processing cerebral regions were activated during the colour-adding task and deactivated during the colour-depleting task, distinctively from the imagery of equivalent colour changes [127]. Additionally, hypnotic suggestions for imagery activated occipital cerebral areas similarly to seeing imagined objects whereas these areas were inactive during the same type of imagery in non-hypnotic contexts [128]. Moreover, hypnotically induced pain was accompanied by higher delta brain waves and the activation of a broad cerebral network, including somatosensory regions and the anterior cingulate cortex, whereas imagined pain had a qualitatively distinct activation pattern [120,129]. These findings provide evidence that neurophysiological changes in response to hypnotic suggestions simulating pain without painful stimuli differ from simple imagery, in line with studies showing increased responsiveness in hypnotised individuals versus simulators [123,130,131]. Although the neurophysiology of common responses to diverse hypnotic suggestions has not been fully explored, these findings offer preliminary evidence of specific neural activity involved in the hypnotic modulation of pain [92, 126]. Whilst hypnotic responding may involve imagery and may be influenced by imagination capacities, the procedures and neurocognitive mechanisms of imagery in response to hypnotic suggestions differ from those of simple imagery [132,133]. In addition to distinguishing hypnosis from simple imagery or role-play, these findings demonstrate the effects of hypnotic suggestions in altering colour perception and pain experiences.

Hypnosis is often confused with meditation and mindfulness, as they share common elements such as relaxation, suggestions, imagery, concentrated attention, mental absorption, and higher receptivity [134, 135]. However, the heightened responsiveness and reduced metacognition allow distinguishing hypnosis from meditation and mindfulness, that both involve increased metacognition without an increased tendency to respond to suggestions [66,72,124,125]. Despite similarities in neural correlates (increased alpha bands), differences in therapy emphasis and neural activity differentiate hypnosis from meditation and mindfulness [119]. Although distinct, hypnosis and mindfulness techniques can be combined in multimodal therapeutic interventions [2,136,137]. For instance, mindfulness-based cognitive hypnotherapy combines hypnosis with cognitive behavioural therapy and mindfulness techniques to expand the scope of hypnosis to various purposes, including treating dermatological problems [138], depression [139], and smoking cessation [137]. However, more research is needed to demonstrate the efficacy of multimodal interventions and further develop treatment techniques for future applications.

Table 2
Discerning hypnosis from other interventions with overlapping features and procedures.

Myth	Fact
The effects of hypnosis are mediated through inducing relaxation.	There is little evidence regarding the superiority of relaxation-based or rapid-alert inductions [4,117].
Hypnosis involves simple imagery and compliance with suggestions.	Hypnosis differs from compliance with suggestions or simple imagery due to differences in procedures and mechanisms, in line with neuro-imaging studies showing that hypnotic suggestions can elicit cerebral changes corresponding with those of genuine perceptual-cognitive or sensory experiences [14,66,118–123].
Hypnosis can be described as a meditation or mindfulness technique.	Heightened responsiveness and reduced metacognition allow distinguishing hypnosis from meditation and mindfulness that involve increased metacognition without an increased tendency to respond to suggestions [66,72,124,125].

5.2. Hypnosis versus relaxation techniques

The use of muscle relaxation techniques for mental relaxation persists today in modern-day medicine and clinical hypnosis. Progressive muscle relaxation (PMR), one of the most commonly used relaxation techniques, was developed to treat peri-operative anxiety based on the belief that relaxing the body is a prerequisite for mental relaxation [140]. PMR consists of focusing the attention on a muscle group followed by tensing this muscle group for a few seconds before releasing the tension as directed by a therapist [141]. Hypnotic inductions typically begin with instructions promoting relaxation and well-being and frequently include relaxation techniques in experimental and clinical situations [58]. A recent meta-analysis on hypnosis for pain revealed that muscle relaxation and eye fixation techniques were used during hypnotic inductions in 33 out of 85 studies [4]. In a recent survey among 691 clinicians who use hypnosis in 31 countries, more than half (55 percent) used hypnotic relaxation in therapy, and the majority (80 percent) used PMR during hypnosis [2].

Muscle relaxation techniques are safe and can be an effective adjunct to hypnosis. First, relaxation can enhance visualisation and focused attention, promoting engagement in hypnosis [142–144]. Second, studies examining the neurophenomenology of relaxation suggest its utility as an

adjunct to hypnosis due to its relaxing effects on the body and mind through reduced autonomic and central arousal [145]. Hypnosis and relaxation share overlapping neurophysiology including higher alpha and theta brain waves and increased parasympathetic activity linked to alterations in cognition and awareness, indicating that relaxation techniques may be useful in promoting hypnotic absorption [145]. In a scoping review of hypnosis for children's procedural pain and distress [146], a study indicated that hypnosis and PMR were similarly effective and significantly superior to standard care [192]. Additionally, relaxation techniques are likely to enhance hypnotic suggestibility, which further supports the utility of their use during hypnosis [147]. PMR, for instance, was accompanied by increased hypnotic suggestibility from moderate to high, which suggests the utility of muscle relaxation techniques in promoting hypnotic responding [148]. Suggestions for relaxation are usually embedded in standard inductions and are postulated to enhance hypnotic responding by facilitating visualisation and focused attention through reduced autonomic and central arousal [142–145,148].

However, despite being attributed to relaxation, hypnotic effects are not merely due to relaxation [2]. Active inductions involving mental alertness have appeared to be as effective as relaxation-based inductions [117,149,150]. A study found that pre-induction instructions for relaxation were less effective than instructions for reduced critical thinking [151]. However, evidence remains scant and inconsistent regarding the superiority of relaxation-based over rapid-alert inductions [4,117]. Consequently, further research is needed to assess the therapeutic outcomes and potential benefits of incorporating muscle relaxation techniques in hypnosis.

5.3. Hypnosis versus breathwork

Breathwork is a mind-body complementary therapy using conscious breathing as a vehicle for accessing emotions, releasing tensions, reducing anxiety, and alleviating pain [152,153]. The use of breathwork is spreading with the increased use of alternative and complementary mental-health practices, particularly mind-body interventions for depression and anxiety [154]. Holotropic breathwork is a well-known technique for self-exploration and therapy, developed in the 1970s by Christina and Stanislav Grof to induce a modified state of consciousness, described as the holotropic state [155]. Holotropic breathwork comprises deep, mindful, deliberate, and fast breathing accompanied by music and optional voluntary bodywork to release tensions and consciously integrate psychological material underlying psychosocial problems (e.g., past unresolved conflicts and emotional blockages) [155–157]. The potential benefits of holotropic breathwork, ranging from expanding awareness to accessing repressed emotions and memories, suggest its potential utility in conjunction with psychotherapeutic or spiritual practices [158].

Despite being mainly nonverbal, holotropic breathwork is induced by a facilitator using a short meditation, suggestions for relaxation, and breathing instructions [158]. Although both hypnosis and holotropic breathwork may involve modified awareness, regression to past events, and access to repressed psychological material, they differ in their core components and therapy vehicles. Breathwork mainly uses nonverbal breathing, whereas hypnosis uses suggestions as core components and therapy vehicles [58,155–158]. Nevertheless, using hypnotic induction before breathwork may be beneficial in individuals with high absorption abilities with whom changes in awareness are postulated to occur during the induction of holotropic breathwork [159]. Despite involving music, the release of muscular tensions, induction, and suggestions components similarly to hypnosis, the key component of holotropic breathwork is deeper and faster conscious breathing [155].

Faster breathing extended for more than 15 minutes can intensify perceptual and cognitive alterations (e.g., heightened visualisation) that may be associated with *temporary hypofrontality*, hypothesised to induce hypnagogic, hypnotic, and psychedelic states [160]. Deliberate faster breathwork has been proposed to induce relaxation, modified awareness, enhanced visualisation, and pleasant feelings [145,156,160–162], which suggests its potential benefit to facilitate hypnotic induction, increase hypnotic suggestibility, and promote absorption in hypnotic phenomena. Faster breathing during hypnotic induction can be particularly beneficial in children and adolescents experiencing fear and anxiety, who may naturally have irregular respiratory rate and intense imagination [163]. However, the utility of combining both hypnosis and breathwork to enhance their therapeutic action has not been thoroughly investigated and thereby merits empirical consideration. More research is warranted to explore the neurophenomenological aspects, clinical applications, and efficacy of combining breathwork with hypnosis for treating a spectrum of psychological, physiological, and psychosomatic conditions.

5.4. Hypnosis versus psychedelics

There are three main chemical classes of psychedelics that act as agonists of serotonin receptors, which are ergolines (e.g., lysergic acid diethylamide), tryptamines (e.g., psilocybin, dimethyltryptamine), and phenethylamines (e.g., mescaline) [164]. The use of psychedelics in spiritual, medicinal, and religious ceremonies dates back to early human history and persists until today. Psychedelics can have sustained benefits on psychological well-being by enabling meaningful and spiritual experiences involving changes in self-awareness, perceptions, cognitions, and emotions [165–168]. The last decade witnessed a renewed interest in psychedelic-assisted psychotherapy with the surge in research exploring the impact of psychedelics, such as psilocybin and lysergic acid diethylamide (LSD) on neuropsychological functions [169–173] and psychological disorders [174–177].

Although earlier research highlighted phenomenological commonalities between psychedelics and hypnosis (e.g., altered time perception, self-awareness, affect, body-image) and explored the benefits of their combined use, recent research examined both approaches separately [178]. Despite commonalities, hypnosis and psychedelics differ in their induction mode (psychopharmacological with psychedelics, suggestion-based with hypnosis) and duration (dependent on drugs' metabolism and clearance with psychedelics, terminated by hypnotherapists or participants in hypnosis). Both early and recent research have suggested combining hypnosis and psychedelics to treat a range of psychopathologies based on overlapping applications and neurophenomenology [178]. For instance, viewing the important role of hypnotic suggestibility in hypnosis outcomes, using psychedelics that can enhance suggestibility (e.g., LSD) may be promising to optimise hypnotic outcomes [179,180]. Further, harnessing the power of suggestions to optimise psychedelic experiences by modulating individual and contextual factors influencing phenomenological responses to psychedelics can optimise the effects of psychedelics and enhance the understanding of their influencing factors [181]. Hypnosis can be used to guide psychedelic experiences (*hypnodelic therapy*), induce drug-free psychedelic like-states, or enhance engagement in psychedelic therapy through hypnotic training while mild doses of psychedelics can be used in enhancing hypnotic experiences [178]. However, the potential of harnessing the power of suggestions to guide phenomenological responses to psychedelics towards more therapeutic actions and using psychedelics to optimise hypnotic outcomes has remained unexplored in recent research [178]. The phenomenology and potential benefits of combining hypnosis and psychedelics need to be further explored to optimise therapy.

5.5. Virtual reality hypnosis

Virtual reality hypnosis is a novel technology and distraction technique embedding hypnosis in an audio-visual sensory experience that shifts the attention from pain and distress without requiring a hypnotherapist or imagination cues [182]. Based on recent studies, virtual reality hypnosis can reduce pain intensity and unpleasantness in adults and children undergoing medical procedures in comparison to control conditions [182–184]. However, combinations or comparisons of

hypnosis and distraction techniques are lacking in reviews supporting the use of both interventions for children's procedural pain and distress [185,186]. This is consistent with a scoping review of hypnosis for children's procedural pain and distress that showed the need for more studies comparing hypnosis with distraction techniques and exploring the benefits of their combined use [7]. Further, little is known regarding the costs of new technologies embedding hypnosis and distraction that may pose a barrier to implementation within budget-constrained healthcare systems [187].

6. Discussion

The mythical misconceptions reported to influence public views surrounding hypnosis can be partially ascribed to history [15]. This paper unravels the historical roots of hypnotic myths that, despite contributing to the evolution of hypnosis, have fostered misconceptions precluding practitioners' adoption and effective implementation of this intervention. Although myths surrounding hypnosis may stem from historical ties to animal magnetism, *artificial somnambulism*, and trance, examining the history of hypnosis as a treatment modality allows advancing knowledge and alleviating historical myths. Thereby, this paper provides an overview of the history of hypnosis in social and political contexts that led to the development of hypnotic treatments in current research and clinical practices.

The prevalence of myths and misconceptions highlights the need to further investigate factors that can influence the acceptability and adoption of hypnosis [146]. Contrary to depicting hypnosis as mystical and overstating efficacy, careful examinations of clinical validity and safety can promote the acceptance of hypnosis as an effective treatment and promote its adoption by clinicians [12]. New research should thus examine the effectiveness and acceptability of hypnosis in real-world clinical settings, along with influencing factors, barriers and facilitators to implementation, and the feasibility of hypnotic procedures [188].

This review discriminates hypnotic and non-hypnotic interventions with overlapping procedures and phenomenological features to enhance the understanding of hypnosis and highlight areas requiring further research to optimise therapies embedding hypnotic techniques. Based on the review, non-hypnotic interventions, including relaxation, breathwork, psychedelics, mindfulness, imagery, and distraction techniques, can be combined with hypnosis in a multimodal approach to optimise pain management, psychotherapy, and healthcare. Preliminary evidence supports combining hypnosis with psychotherapeutic interventions such as relaxation techniques, cognitive-behavioural therapy, mindfulness, and distraction techniques to enhance therapy outcomes, implementation, and tailoring [7,189–191]. By highlighting commonalities and differences between hypnosis and non-hypnotic interventions, the review indicates the potential value of coupling hypnosis with these interventions in healthcare, which warrants further investigation. This coupling includes the frequent use of hypnosis in conjunction with different forms of psychotherapy or in psychotherapeutic contexts [7,11,189].

6.1. Strengths and limitations

By presenting research and historical evidence discerning myths from facts, this article is an important step towards adequately informing clinicians and the public regarding hypnosis and alleviating misconceptions that have hindered the adoption of this intervention. Considering that evidence regarding the neurophysiological changes underpinning hypnotic responding are inconsistent and that neural correlates of the hypnotic experience are lacking, neurophysiological findings examining hypnotic mechanisms and effects are solely presented in this review to further distinguish hypnosis from other interventions. For instance, evidence of the neuro-mechanisms of hypnotic analgesia is provided to support the previously reported findings regarding the effects of hypnosis on pain and distress and to discern hypnosis from simple imagery. Thus, this review is important to disseminate accurate information, advance knowledge, and pinpoint areas that need to be addressed in further research.

7. Conclusion and future directions

This review attempts to explain hypnosis and dispel related misconceptions using existing evidence. This evidence can serve several important roles, including promoting a positive attitude towards hypnosis among the general public and encouraging clinicians' adoption of this intervention in research and clinical settings.

By demarcating myths from facts, highlighting what is known and what needs to be investigated, and distinguishing between hypnotic and non-hypnotic procedures and phenomena, the review can serve as foundation to advance the science and practice of hypnosis. Further studies should explore the implementation, feasibility, and acceptability of hypnosis to promote the dissemination and adoption of hypnotic interventions. Based on the review, it is crucial to address misconceptions by explaining hypnosis in the pre-hypnotic phase to promote the acceptability of this intervention. Future acceptability research and surveys of attitudes towards hypnosis can enhance participation in hypnosis research by exploring major misconceptions and negative attitudes impeding the adoption and acceptability of hypnosis in clinical and research settings. Although the review differentiates hypnotic and non-hypnotic interventions and suggests potential value in coupling these interventions, the utility, acceptability, feasibility, implementation and cost of these combinations require further examination. Our next paper, examining theories and definitions of hypnosis, will delve into the classification of therapeutic hypnosis and the debate regarding whether or not hypnosis can be considered a treatment modality in its own right.

Funding statement

The proposed research received no specific grant from any funding agency in public, commercial, or not-for-profit sectors.

Authors' contributions

All authors contributed to the study design. DG drafted the manuscript. Critical review, editing, and approval of the final manuscript draft were conducted by all authors.

Declaration of competing interest

The authors have declared no competing interests.

Acknowledgements

We would like to thank Dr Devin B. Terhune for assisting with the theory section and reviewing the paper.

References

[1] A. Gauld, A History of Hypnotism, Cambridge University Press, 1992.
[2] O.S. Palsson, Z. Kekecs, G. De Benedittis, D. Moss, G. Elkins, D.B. Terhune, et al., Current practices, experiences, and views in clinical hypnosis: findings of an international survey, Int. J. Clin. Exp. Hypn. 71 (2) (2023) 92–114, https://doi.org/10.1080/00207144.2023.2183862.
[3] A. Vanhaudenhuyse, S. Laureys, M.E. Faymonville, Neurophysiology of hypnosis, Neurophysiol. Clin. 44 (4) (2014) 343–353, https://doi.org/10.1016/j.neucli.2013.09.006.
[4] T. Thompson, D.B. Terhune, C. Oram, J. Sharangparni, R. Rouf, M. Solmi, et al., The effectiveness of hypnosis for pain relief: a systematic review and meta-analysis of 85 controlled experimental trials, Neurosci. Biobehav. Rev. 99 (2019) 298–310, https://doi.org/10.1016/j.neubiorev.2019.02.013.
[5] P.D. Shenefelt, Use of hypnosis, meditation, and biofeedback in dermatology, Clin. Dermatol. 35 (3) (2017) 285–291, https://doi.org/10.1016/j.clindermatol.2017.01.007.

[6] M. Franch, A. Alarcón, A. Capafons, Applications of hypnosis as an adjuvant in oncological settings: a systematic review, Int. J. Clin. Exp. Hypn. 71 (1) (2023) 1–24, https://doi.org/10.1080/00207144.2022.2160255.
[7] D. Geagea, Z. Tyack, R. Kimble, V. Polito, B. Ayoub, D.B. Terhune, et al., Clinical hypnosis for procedural pain and distress in children: a scoping review, Pain Med. (2022), https://doi.org/10.1093/pm/pnac186 pnac186.
[8] K.A. Birnie, M. Noel, J.A. Parker, C.T. Chambers, L.S. Uman, S.R. Kisely, et al., Systematic review and meta-analysis of distraction and hypnosis for needle-related pain and distress in children and adolescents, J. Pediatr. Psychol. 39 (8) (2014) 783–808, https://doi.org/10.1093/jpepsy/jsu029.
[9] K.E. Valentine, L.S. Milling, L.J. Clark, C.L. Moriarty, The efficacy of hypnosis as a treatment for anxiety: a meta-analysis, Int. J. Clin. Exp. Hypn. 67 (3) (2019) 336–363, https://doi.org/10.1080/00207144.2019.1613863.
[10] P Langlois, A Perrochon, R David, P Rainville, C Wood, A Vanhaudenhuyse, B Pageaux, A Ounajim, M Lavallière, U Debarnot, C Luque-Moreno, Hypnosis to manage musculoskeletal and neuropathic chronic pain: a systematic review and meta-analysis, Neurosc. Biobehav. Rev. 19 (2022 Feb), 104591.
[11] V.M. Yeh, J.B. Schnur, G.H. Montgomery, Disseminating hypnosis to health care settings: applying the RE-AIM framework, Psychol Conscious 1 (2) (2014) 213–228, https://doi.org/10.1037/cns0000012.
[12] J.F. Chaves, S.F. Dworkin, Hypnotic control of pain: historical perspectives and future prospects, Int. J. Clin. Exp. Hypn. 45 (4) (1997) 356–376, https://doi.org/10.1080/00207149708416138.
[13] Z. Kekecs, D. Moss, G. Elkins, G. De Benedittis, O. Palsson, P. Shenefelt, et al., Guidelines for the assessment of efficacy of clinical hypnosis applications, Int. J. Clin. Exp. Hypn. 70 (2) (2022) 104–122, https://doi.org/10.1080/00207144.2022.2049446.
[14] S.J. Lynn, I. Kirsch, D.B. Terhune, J.P. Green, Myths and misconceptions about hypnosis and suggestion: separating fact and fiction, Appl. Cognit. Psychol. 34 (6) (2020) 1253–1264, https://doi.org/10.1002/acp.3730.
[15] J. Meyerson, The myth of hypnosis: the need for remythification, Int. J. Clin. Exp. Hypn. 62 (3) (2014) 378–393, https://doi.org/10.1080/00207144.2014.901090.
[16] P.M. Barnes, B. Bloom, R.L. Nahin, Complementary and Alternative Medicine Use Among Adults and Children: United States, 2007, 2008 Dec 10. Report No.: 2164-8344 Contract No.: 12.
[17] T. Gansler, C. Kaw, C. Crammer, T. Smith, A population-based study of prevalence of complementary methods use by cancer survivors: a report from the American Cancer Society's studies of cancer survivors, Cancer 113 (5) (2008) 1048–1057, https://doi.org/10.1002/cncr.23659.
[18] J.M. Fouladbakhsh, M. Stommel, Comparative analysis of CAM use in the US cancer and noncancer populations, J. Compl. Integr. Med. 5 (1) (2008), https://doi.org/10.2202/1553-3840.1140.
[19] A.D. Schnee, Effect of Psychological Preparation on Reducing Behavioral Distress and Morbidity in Children Undergoing Endoscopy [PhD], Georgia State University, Ann Arbor, 1995.
[20] S.A. Lambert, The effects of hypnosis/guided imagery on the postoperative course of children, J. Dev. Behav. Pediatr. 17 (5) (1996) 307–310, https://doi.org/10.1097/00004703-199610000-00003.
[21] L.K. Zeltzer, M.J. Dolgin, S. LeBaron, C. LeBaron, A randomized, controlled study of behavioral intervention for chemotherapy distress in children with cancer, Pediatrics 88 (1) (1991) 34–42, https://doi.org/10.1542/peds.88.1.34.
[22] R.W. Olmsted, L. Zeltzer, S. LeBaron, Hypnosis and nonhypnotic techniques for reduction of pain and anxiety during painful procedures in children and adolescents with cancer, J. Pediatr. 101 (6) (1982) 1032–1035, https://doi.org/10.1016/s0022-3476(82)80040-1.
[23] J. Kellerman, L. Zeltzer, L. Ellenberg, J. Dash, Adolescents with cancer: hypnosis for the reduction of the acute pain and anxiety associated with medical procedures, J. Adolesc. Health Care 4 (2) (1983) 85–90, https://doi.org/10.1016/s0197-0070(83)80024-2.
[24] J.P. Green, Beliefs about hypnosis: popular beliefs, misconceptions, and the importance of experience, Int. J. Clin. Exp. Hypn. 51 (4) (2003) 369–381, https://doi.org/10.1076/iceh.51.4.369.16408.
[25] J.P. Green, R.A. Page, R. Rasekhy, L.K. Johnson, S.E. Bernhardt, Cultural views and attitudes about hypnosis: a survey of college students across four countries, Int. J. Clin. Exp. Hypn. 54 (3) (2006) 263–280, https://doi.org/10.1080/00207140600689439.
[26] A. Capafons, M.E. Mendoza, B. Espejo, J.P. Green, C. Lopes-Pires, M.L. Selma, et al., Attitudes and beliefs about hypnosis: a multicultural study, Contemp. Hypn. 25 (3-4) (2008) 141–155, https://doi.org/10.1002/ch.359.
[27] M.E. Johnson, C. Hauck, Beliefs and opinions about hypnosis held by the general public: a systematic evaluation, Am. J. Clin. Hypn. 42 (1) (1999) 10–20, https://doi.org/10.1080/00029157.1999.10404241.
[28] K. Gow, C. Mackie, D. Clohessy, T. Cowling, R. Maloney, D. Chant, Attitudes and opinions about hypnosis in an Australian city, Aust. J. Clin. Exp. Hypn. 34 (2) (2006) 162.
[29] N.P. Spanos, J.D. McPeake, Involvement in everyday imaginative activities, attitudes toward hypnosis, and hypnotic suggestibility, J. Pers. Soc. Psychol. 31 (3) (1975) 594–598, https://doi.org/10.1037/h0076509.
[30] M.P. Jensen, T. Adachi, C. Tome-Pires, J. Lee, Z.J. Osman, J. Miro, Mechanisms of hypnosis: toward the development of a biopsychosocial model, Int. J. Clin. Exp. Hypn. 63 (1) (2015) 34–75, https://doi.org/10.1080/00207144.2014.961875.
[31] J.P. Green, C.R. Houts, A. Capafons, Attitudes about hypnosis: factor analyzing the VSABTH-C with an American sample, Am. J. Clin. Hypn. 54 (3) (2012) 167–178, https://doi.org/10.1080/00029157.2011.616823.
[32] G. Benham, E.Z. Woody, K.S. Wilson, M.R. Nash, Expect the unexpected: ability, attitude, and responsiveness to hypnosis, J. Pers. Soc. Psychol. 91 (2) (2006) 342–350, https://doi.org/10.1037/0022-3514.91.2.342.
[33] N.P. Spanos, M.C.E. Burnley, P.A. Cross, Response expectancies and interpretations as determinants of hypnotic responding, J. Pers. Soc. Psychol. 65 (6) (1993) 1237–1242, https://doi.org/10.1037/0022-3514.65.6.1237.
[34] S.J. Lynn, J.P. Green, A. Zahedi, C. Apelian, The response set theory of hypnosis reconsidered: toward an integrative model, Am. J. Clin. Hypn. 65 (3) (2023) 186–210, https://doi.org/10.1080/00029157.2022.2117680.
[35] G.H. Montgomery, M. Sucala, M.J. Dillon, J.B. Schnur, Interest and attitudes about hypnosis in a large community sample, Psychol Conscious (Wash D C) 5 (2) (2018) 212–220, https://doi.org/10.1037/cns0000141.
[36] J.A. Molina, M.E. Mendoza, Change of attitudes towards hypnosis after a training course, Aust. J. Clin. Exp. Hypn. 34 (2) (2006) 146.
[37] R. Hawkins, J. Bartsch, The effects of an educational lecture about hypnosis, Aust. J. Clin. Exp. Hypn. 28 (1) (2000) 82–99.
[38] S.J. Sohl, L. Stossel, J.B. Schnur, K. Tatrow, A. Gherman, G.H. Montgomery, Intentions to use hypnosis to control the side effects of cancer and its treatment, Am. J. Clin. Hypn. 53 (2) (2010) 93–100, https://doi.org/10.1080/00029157.2010.10404331.
[39] D. Hermes, S.G. Hakim, P. Sieg, Acceptance of medical hypnosis by oral and maxillofacial patients, Int. J. Clin. Exp. Hypn. 52 (4) (2004) 389–399, https://doi.org/10.1080/00207140490886227.
[40] M. Krouwel, K. Jolly, S. Greenfield, What the public think about hypnosis and hypnotherapy: a narrative review of literature covering opinions and attitudes of the general public 1996–2016, Compl. Ther. Med. 32 (2017) 75–84, https://doi.org/10.1016/j.ctim.2017.04.002.
[41] J. Rycroft-Malone, The PARIHS framework-a framework for guiding the implementation of evidence-based practice, J. Nurs. Care Qual. 19 (4) (2004) 297–304, https://doi.org/10.1097/00001786-200410000-00002.
[42] J. Rycroft-Malone, K. Seers, J. Chandler, C.A. Hawkes, N. Crichton, C. Allen, et al., The role of evidence, context, and facilitation in an implementation trial: implications for the development of the PARIHS framework, Implement. Sci. 8 (1) (2013) 28, https://doi.org/10.1186/1748-5908-8-28.
[43] F.G. Haddad, E. Abboche, R. Mohanna, S. El Khoury, R. Eid, M.J. Lahoud, et al., The opinion of oncologists on the practice of hypnosis among cancer patients in Lebanon, Compl. Ther. Med. 53 (2020), 102534, https://doi.org/10.1016/j.ctim.2020.102534.
[44] J. Coldrey, A. Cyna, Suggestion, hypnosis and hypnotherapy: a survey of use, knowledge and attitudes of anaesthetists, Anaesth. Intensive Care 32 (5) (2004) 676–680, https://doi.org/10.1177/0310057X0403200513.
[45] M. Martín, A. Capafons, B. Espejo, M.E. Mendoza, M. Guerra, J.A. Enríquez Santos, et al., Impact of a lecture about empirical bases of hypnosis on beliefs and attitudes toward hypnosis among Cuban health professionals, Int. J. Clin. Exp. Hypn. 58 (4) (2010) 476–496, https://doi.org/10.1080/00207144.2010.499351.
[46] A. Capafons, S. Cabañas, A. Alarcón, B. Espejo, M.E. Mendoza, J.F. Chaves, et al., Effects of different types of preparatory information on attitudes toward hypnosis, Contemp. Hypn. 22 (2) (2005) 67–76, https://doi.org/10.1002/ch.25.
[47] M.E. Mendoza, A. Capafons, B. Espejo, Impact of reading a scientific journal issue about hypnosis on the beliefs and attitudes towards hypnosis among psychologists, Psychology, Society & Education 1 (1 y 2) (2009) 25–37, https://doi.org/10.21071/psye.v1i1%20y%202.13699.
[48] J. Chaves (Ed.), Hypnosis in the Health-Care Setting: Hopes, Beliefs and Experience, 112th American Psychological Association Annual Convention, Honolulu, HI, 2004.
[49] L. Thomson, A project to change the attitudes, beliefs and practices of health professionals concerning hypnosis, Am. J. Clin. Hypn. 46 (1) (2003) 31–44, https://doi.org/10.1080/00029157.2003.10403563.
[50] J. Aramideh, T. Mizrahi, M.-C. Charest, C. Plante, M. Duval, S. Sultan, Development and inter-rater reliability of a tool assessing hypnotic communication behaviours adopted by nurses caring for children with cancer: the Sainte-Justine Hypnotic Communication Assessment Scale, Compl. Ther. Med. 37 (2018) 178–184, https://doi.org/10.1016/j.ctim.2017.11.013.
[51] J. Meyerson, M. Gelkopf, G. Golan, E. Shahamorov, What motivates professionals to learn and use hypnosis in clinical practice? Int. J. Clin. Exp. Hypn. 61 (1) (2013) 71–80, https://doi.org/10.1080/00207144.2013.729437.
[52] H.F. Ellenberger, The Discovery of the Unconscious: the History and Evolution of Dynamic Psychiatry, Basic Books New York, New York, 1970.
[53] Forrest D. Mesmer, Int. J. Clin. Exp. Hypn. 50 (4) (2002) 295–308, https://doi.org/10.1080/00207140208410106.
[54] I. Kirsch, The social learning theory of hypnosis, in: S.J. Lynn, J.W. Rhue (Eds.), Theories of Hypnosis: Current Models and Perspectives. The Guilford Clinical and Experimental Hypnosis Series., Guilford Press, New York, NY, US, 1991, pp. 439–465.
[55] S.J. Lynn, I. Kirsch, Essentials of Clinical Hypnosis: an Evidence-Based Approach, American Psychological Association, 2006.
[56] E. Cardeña, D.B. Terhune, The roles of response expectancies, baseline experiences, and hypnotizability in spontaneous hypnotic experiences, Int. J. Clin. Exp. Hypn. 67 (1) (2019) 1–27, https://doi.org/10.1080/00207144.2019.1553759.
[57] A.B. Plotnick, P.A. Payne, D.J. O'Grady, Correlates of hypnotizability in children: absorption, vividness of imagery, fantasy play, and social desirability, Am. J. Clin. Hypn. 34 (1) (1991) 51–58, https://doi.org/10.1080/00029157.1991.10402960.
[58] M.D. Yapko, Essentials of Hypnosis, Routledge, 2013.

[59] V. Polito, A.J. Barnier, E.Z. Woody, Developing the Sense of Agency Rating Scale (SOARS): an empirical measure of agency disruption in hypnosis, Conscious. Cognit. 22 (3) (2013) 684–696, https://doi.org/10.1016/j.concog.2013.04.003.

[60] S.J. Lynn, M.R. Nash, J.W. Rhue, D.C. Frauman, C.A. Sweeney, Nonvolition, expectancies, and hypnotic rapport, J. Abnorm. Psychol. 93 (3) (1984) 295–303, https://doi.org/10.1037//0021-843x.93.3.295.

[61] N.P. Spanos, P.C. Cobb, D.R. Gorassini, Failing to resist hypnotic test suggestions: a strategy for self-presenting as deeply hypnotized, Psychiatry 48 (3) (1985) 282–292, https://doi.org/10.1080/00332747.1985.11024288.

[62] N.P. Spanos, J.R. Weekes, M. de Groh, The" involuntary" countering of suggested requests: a test of the ideomotor hypothesis of hypnotic responsiveness, Contemp. Hypn. 1 (3) (1984) 3–11, https://doi.org/10.1002/ch.220.

[63] M.D. Feldman, J.F. Christensen, J.M. Satterfield, Behavioral Medicine: A Guide for Clinical Practice, 5 ed, McGraw-Hill Medical, 2019.

[64] C.E. Silva, I. Kirsch, Breaching hypnotic amnesia by manipulating expectancy, J. Abnorm. Psychol. 96 (4) (1987) 325–329, https://doi.org/10.1037//0021-843x.96.4.325.

[65] P. Rainville, Neurophénoménologie des états et des contenus de conscience dans l'hypnose et l'analgésie hypnotique, Théologiques 12 (1–2) (2004) 15–38, https://doi.org/10.7202/011554ar.

[66] P. Rainville, D.D. Price, Hypnosis phenomenology and the neurobiology of consciousness, Int. J. Clin. Exp. Hypn. 51 (2) (2003) 105–129, https://doi.org/10.1076/iceh.51.2.105.14613.

[67] N.A. Chan, Z. Zhang, G. Yin, Z. Li, R.C. Ho, Update on hypnotherapy for psychiatrists, BJPsych Adv. (2021) 1–7, https://doi.org/10.1192/bja.2021.54.

[68] J.H. Gruzelier, Redefining hypnosis: theory, methods and integration, Contemp. Hypn. 17 (2) (2000) 51–70, https://doi.org/10.1002/ch.193.

[69] W.J. McGeown, G. Mazzoni, A. Venneri, I. Kirsch, Hypnotic induction decreases anterior default mode activity, Conscious. Cognit. 18 (4) (2009) 848–855, https://doi.org/10.1016/j.concog.2009.09.001.

[70] The Merriam-Webster Online Dictionary, Somnambulism: Merriam-Webster, 2023 [Available from: https://www.merriam-webster.com/dictionary/somnambulism.

[71] J.F. Kihlstrom, The domain of hypnosis, revisited, in: Barnier AJ. Nash (Ed.), The Oxford Handbook of Hypnosis: Theory, Research and Practice, Oxford University Press, 2008, pp. 21–52.

[72] G.F. Wagstaff, On the centrality of the concept of an altered state to definitions of hypnosis, The Journal of Mind-Body Regulation 2 (2) (2014) 90–108.

[73] G.R. Elkins, A.F. Barabasz, J.R. Council, D. Spiegel, Advancing research and practice: the revised APA Division 30 definition of hypnosis, Int. J. Clin. Exp. Hypn. 63 (1) (2015) 1–9, https://doi.org/10.1080/00207144.2014.961870.

[74] H.J. Crawford, A.M. Brown, C.E. Moon, Sustained attentional and disattentional abilities - differences between low and highly hypnotizable persons, J. Abnorm. Psychol. 102 (4) (1993) 534–543, https://doi.org/10.1037/0021-843x.102.4.534.

[75] A. Raz, Suggestibility and hypnotizability: mind the gap, Am. J. Clin. Hypn. 49 (3) (2007) 205–210, https://doi.org/10.1080/00029157.2007.10401582.

[76] A. Tellegen, G. Atkinson, Openness to absorbing and self-altering experiences ("absorption"), a trait related to hypnotic susceptibility, J. Abnorm. Psychol. 83 (3) (1974) 268–277, https://doi.org/10.1037/h0036681.

[77] P.W. Sheehan, K.M. McConkey, Hypnosis and Experience: an Analysis of Phenomena and Process, Erlbaum, Hillsdale, NJ, 1982.

[78] S.J. Lynn, J.R. Weekes, M.J. Milano, Reality versus suggestion: pseudomemory in hypnotizable and simulating subjects, J. Abnorm. Psychol. 98 (2) (1989) 137, https://doi.org/10.1037//0021-843x.98.2.137.

[79] The merriam-webster online dictionary. Influenceability. https://www.merriam-webster.com/dictionary/influenceability, 2023 [Available from:.

[80] D.B. Terhune, E. Cardeña, M. Lindgren, Dissociative tendencies and individual differences in high hypnotic suggestibility, Cognit. Neuropsychiatry 16 (2) (2011) 113–135, https://doi.org/10.1080/13546805.2010.503048.

[81] M.R. Nash, G. Benham, The truth and the hype of hypnosis, Sci. Am. Mind 16 (2) (2005) 46–53, https://doi.org/10.1038/scientificamericanmind0605-46.

[82] E. Fromm, Significant developments in clinical hypnosis during the past 25 years, Int. J. Clin. Exp. Hypn. 35 (4) (1987) 215–230, https://doi.org/10.1080/00207148708416056.

[83] W.J. Matthews, Ericksonian approaches to hypnosis and therapy: where are we now? Int. J. Clin. Exp. Hypn. 48 (4) (2000) 418–426, https://doi.org/10.1080/00207140008410370.

[84] E.R. Hilgard, Hypnotic Susceptibility, Harcourt, Brace & World, Oxford, England, 1965.

[85] M. Moayedi, K.D. Davis, Theories of pain: from specificity to gate control, J. Neurophysiol. 109 (1) (2013) 5–12, https://doi.org/10.1152/jn.00457.2012.

[86] A.H. Morgan, E.R. Hilgard, Age differences in susceptibility to hypnosis, Int. J. Clin. Exp. Hypn. 21 (2) (1973) 78–85, https://doi.org/10.1080/00207147308409308.

[87] G.H. Montgomery, K.N. DuHamel, W.H. Redd, A meta-analysis of hypnotically induced analgesia: how effective is hypnosis? Int. J. Clin. Exp. Hypn. 48 (2) (2000) 138–153, https://doi.org/10.1080/00207140008410045.

[88] M.E. Faymonville, T. Defechereux, J. Joris, J.P. Adant, E. Hamoir, M.L. Meurisse, 'hypnose et son application en chirurgie, Rev. Med. Liege 53 (7) (1998) 414–418.

[89] M. Landry, M. Lifshitz, A. Raz, Brain correlates of hypnosis: a systematic review and meta-analytic exploration, Neurosci. Biobehav. Rev. 81 (Pt A) (2017) 75–98, https://doi.org/10.1016/j.neubiorev.2017.02.020.

[90] J. Richardson, J.E. Smith, G. McCall, K. Pilkington, Hypnosis for procedure-related pain and distress in pediatric cancer patients: a systematic review of effectiveness and methodology related to hypnosis interventions, J. Pain Symptom Manag. 31 (1) (2006) 70–84, https://doi.org/10.1016/j.jpainsymman.2005.06.010.

[91] A.J. Barnier, Z. Dienes, C.J. Mitchell, How hypnosis happens: new cognitive theories of hypnotic responding, in: M.R. Nash, A.J. Barnier (Eds.), The Oxford Handbook of Hypnosis: Theory, Research, and Practice, Oxford University Press, New York, NY, US, 2008, pp. 141–177.

[92] M.P. Jensen, G.A. Jamieson, A. Lutz, G. Mazzoni, W.J. McGeown, E. L. Santarcangelo, et al., New directions in hypnosis research: strategies for advancing the cognitive and clinical neuroscience of hypnosis, Neurosci Conscious 3 (1) (2017), https://doi.org/10.1093/nc/nix004 nix004.

[93] D.C. Hammond, Hypnosis in the treatment of anxiety- and stress-related disorders, Expert Rev. Neurother. 10 (2) (2010) 263–273, https://doi.org/10.1586/ern.09.140.

[94] D.C. Hammond, Review of the efficacy of clinical hypnosis with headaches and migraines, Int. J. Clin. Exp. Hypn. 55 (2) (2007) 207–219, https://doi.org/10.1080/00207140601177921.

[95] D. Ogez, J. Aramideh, T. Mizrahi, M.C. Charest, C. Plante, M. Duval, et al., Does practising hypnosis-derived communication techniques by oncology nurses translate into reduced pain and distress in their patients? An exploratory study, Br. J. Pain 15 (2) (2021) 147–154, https://doi.org/10.1177/2049463720932949.

[96] D.C. Brown, D.C. Hammond, Evidence-based clinical hypnosis for obstetrics, labor and delivery, and preterm labor, Int. J. Clin. Exp. Hypn. 55 (3) (2007) 355–371, https://doi.org/10.1080/00207140701338654.

[97] M. Abbasi, A. Barlow-Harrison, The effect of hypnosis on pain relief during labor and childbirth in Iranian pregnant women, J. Reprod. Infant Psychol. 26 (3) (2008) 266–267, https://doi.org/10.1080/00207140802665435.

[98] D.R. Patterson, M.P. Jensen, Hypnosis and clinical pain, Psychol. Bull. 129 (4) (2003) 495–521, https://doi.org/10.1037/0033-2909.129.4.495.

[99] C. Tome-Pires, J. Miro, Hypnosis for the management of chronic and cancer procedure-related pain in children, Int. J. Clin. Exp. Hypn. 60 (4) (2012) 432–457, https://doi.org/10.1080/00207144.2012.701092.

[100] M.C. Accardi, L.S. Milling, The effectiveness of hypnosis for reducing procedure-related pain in children and adolescents: a comprehensive methodological review, J. Behav. Med. 32 (4) (2009) 328–339, https://doi.org/10.1007/s10865-009-9207-6.

[101] M.R. Wild, C.A. Espie, The efficacy of hypnosis in the reduction of procedural pain and distress in pediatric oncology: a systematic review, J. Dev. Behav. Pediatr. 25 (3) (2004) 207–213, https://doi.org/10.1097/00004703-200406000-00010.

[102] L. Kuttner, Pediatric hypnosis: pre-, peri-, and post-anesthesia, Paediatr. Anaesth. 22 (6) (2012) 573–577, https://doi.org/10.1111/j.1460-9592.2012.03860.x.

[103] G.E. Miller, S. Cohen, Psychological interventions and the immune system: a meta-analytic review and critique, Health Psychol. 20 (1) (2001) 47–63, https://doi.org/10.1037//0278-6133.20.1.47.

[104] R. Schaefert, P. Klose, G. Moser, W. Hauser, Efficacy, tolerability, and safety of hypnosis in adult irritable bowel syndrome: systematic review and meta-analysis, Psychosom. Med. 76 (5) (2014) 389–398, https://doi.org/10.1097/PSY.0000000000000039.

[105] J. Rutten, J.J. Korterink, L. Venmans, M.A. Benninga, M.M. Tabbers, Nonpharmacologic treatment of functional abdominal pain disorders: a systematic review, Pediatrics 135 (3) (2015) 522–535, https://doi.org/10.1542/peds.2014-2123.

[106] J. Rutten, J.B. Reitsma, A.M. Vlieger, M.A. Benninga, Gut-directed hypnotherapy for functional abdominal pain or irritable bowel syndrome in children: a systematic review, Arch. Dis. Child. 98 (4) (2013) 252–257, https://doi.org/10.1136/archdischild-2012-302906.

[107] S. Wilson, T. Maddison, L. Roberts, S. Greenfield, S. Singh, B.I.R. Group, Systematic review: the effectiveness of hypnotherapy in the management of irritable bowel syndrome, Aliment. Pharmacol. Ther. 24 (5) (2006) 769–780, https://doi.org/10.1111/j.1365-2036.2006.03028.x.

[108] J. Richardson, J. Smith, G. McCall, A. Richardson, K. Pilkington, I. Kirsch, Hypnosis for nausea and vomiting in cancer chemotherapy: a systematic review of the research evidence, Eur. J. Cancer Care 16 (5) (2007) 402–412, https://doi.org/10.1111/j.1365-2354.2006.00736.x.

[109] G.R. Elkins, W.I. Fisher, A.K. Johnson, J.S. Carpenter, T.Z. Keith, Clinical hypnosis in the treatment of post-menopausal hot flashes: a randomized controlled trial, Menopause 20 (3) (2013), https://doi.org/10.1097/GME.0b013e31826ce3ed.

[110] J.R. Kleinbub, A. Palmieri, A. Broggio, F. Pagnini, E. Benelli, M. Sambin, et al., Hypnosis-based psychodynamic treatment in ALS: a longitudinal study on patients and their caregivers, Front. Psychol. 6 (2015) 822, https://doi.org/10.3389/fpsyg.2015.00822.

[111] L.S. Milling, M.C. Gover, C.L. Moriarty, The effectiveness of hypnosis as an intervention for obesity: a meta-analytic review, Psychol Conscious (Wash D C) 5 (1) (2018) 29, https://doi.org/10.1037/cns0000139.

[112] L.S. Milling, K.E. Valentine, H.S. McCarley, L.M. LoStimolo, A meta-analysis of hypnotic interventions for depression symptoms: high hopes for hypnosis? Am. J. Clin. Hypn. 61 (3) (2019) 227–243, https://doi.org/10.1080/00029157.2018.1489777.

[113] T.-Ş. Rotaru, A. Rusu, A meta-analysis for the efficacy of hypnotherapy in alleviating PTSD symptoms, Int. J. Clin. Exp. Hypn. 64 (1) (2016) 116–136, https://doi.org/10.1080/00207144.2015.1099406.

[114] F.M. Hasan, S.E. Zagarins, K.M. Pischke, S. Saiyed, A.M. Bettencourt, L. Beal, et al., Hypnotherapy is more effective than nicotine replacement therapy for smoking cessation: results of a randomized controlled trial, Compl. Ther. Med. 22 (1) (2014) 1–8, https://doi.org/10.1016/j.ctim.2013.12.012.

[115] J. Barnes, C.Y. Dong, H. McRobbie, N. Walker, M. Mehta, L.F. Stead, Hypnotherapy for smoking cessation, Cochrane Database Syst. Rev. 10 (2010), CD001008, https://doi.org/10.1002/14651858.CD001008.pub2.
[116] P.D. Shenefelt, Hypnosis in dermatology, Arch. Dermatol. 136 (3) (2000) 393–399, https://doi.org/10.1001/archderm.136.3.393.
[117] D.B. Terhune, E. Cardena, Nuances and uncertainties regarding hypnotic inductions: toward a theoretically informed praxis, Am. J. Clin. Hypn. 59 (2) (2016) 155–174, https://doi.org/10.1080/00029157.2016.1201454.
[118] I. Kirsch, S.J. Lynn, The altered state of hypnosis - changes in the theoretical landscape, Am. Psychol. 50 (10) (1995) 846–858, https://doi.org/10.1037/0003-066x.50.10.846.
[119] G. De Benedittis, Neural mechanisms of hypnosis and meditation, J. Physiol. Paris 109 (4–6) (2015) 152–164, https://doi.org/10.1016/j.jphysparis.2015.11.001.
[120] S.W. Derbyshire, M.G. Whalley, V.A. Stenger, D.A. Oakley, Cerebral activation during hypnotically induced and imagined pain, Neuroimage 23 (1) (2004) 392–401, https://doi.org/10.1016/j.neuroimage.2004.04.033.
[121] J.H. Stewart (Ed.), Hypnosis in Contemporary Medicine, Mayo Clin Proc, 2005 (Elsevier).
[122] M.E. Faymonville, M. Boly, S. Laureys, Functional neuroanatomy of the hypnotic state, J. Physiol. Paris 99 (4–6) (2006) 463–469, https://doi.org/10.1016/j.jphysparis.2006.03.018.
[123] E.M. Perugini, I. Kirsch, S.T. Allen, E. Coldwell, J.M. Meredith, G.H. Montgomery, et al., Surreptitious observation of responses to hypnotically suggested hallucinations: a test of the compliance hypothesis, Int. J. Clin. Exp. Hypn. 46 (2) (1998) 191–203, https://doi.org/10.1080/00207149808409999.
[124] V. Polito, A.J. Barnier, E.Z. Woody, M.H. Connors, Measuring agency change across the domain of hypnosis, Psychol Conscious (Wash D C) 1 (1) (2014) 3–19, https://doi.org/10.1037/cns0000010.
[125] P. Lush, P. Naish, Z. Dienes, Metacognition of intentions in mindfulness and hypnosis, Neurosci Conscious 2016 (1) (2016), https://doi.org/10.1093/nc/niw007 niw007.
[126] D.A. Oakley, P.W. Halligan, Hypnotic suggestion: opportunities for cognitive neuroscience, Nat. Rev. Neurosci. 14 (8) (2013) 565–576, https://doi.org/10.1038/nrn3538.
[127] S.M. Kosslyn, W.L. Thompson, M.F. Costantini-Ferrando, N.M. Alpert, D. Spiegel, Hypnotic visual illusion alters color processing in the brain, Am. J. Psychiatr. 157 (8) (2000) 1279–1284, https://doi.org/10.1176/appi.ajp.157.8.1279.
[128] I. Kirsch, The altered state issue: dead or alive? Int. J. Clin. Exp. Hypn. 59 (3) (2011) 350–362, https://doi.org/10.1080/00207144.2011.570681.
[129] P. Rainville, B. Carrier, R.K. Hofbauer, M.C. Bushnell, G.H. Duncan, Dissociation of sensory and affective dimensions of pain using hypnotic modulation, Pain 82 (2) (1999) 159–171, https://doi.org/10.1016/S0304-3959(99)00048-2.
[130] I. Kirsch, C.E. Silva, J.E. Carone, J.D. Johnston, B. Simon, The surreptitious observation design: an experimental paradigm for distinguishing artifact from essence in hypnosis, J. Abnorm. Psychol. 98 (2) (1989) 132, https://doi.org/10.1037//0021-843x.98.2.132.
[131] F.J. Evans, M.T. Orne, The disappearing hypnotist: the use of simulating subjects to evaluate how subjects perceive experimental procedures, Int. J. Clin. Exp. Hypn. 19 (4) (1971) 277–296, https://doi.org/10.1080/00207147108407173.
[132] D.B. Terhune, D. Oakley, Hypnosis and Imagination. The Cambridge Handbook of the Imagination, Cambridge University Press, 2020, pp. 711–727.
[133] T.X. Barber, N.P. Spanos, J.F. Chaves, Hypnosis, Imagination, and Human Potentialities, Pergamon, 1974.
[134] A. Raz, M. Lifshitz, Hypnosis and Meditation: towards an Integrative Science of Conscious Planes, Oxford University Press, 2016.
[135] M.D. Yapko, Mindfulness and Hypnosis: the Power of Suggestion to Transform Experience, WW Norton & Company, 2011.
[136] S. Jay Lynn, L. Surya Das, M.N. Hallquist, J.C. Williams, Mindfulness, acceptance, and hypnosis: cognitive and clinical perspectives, Int. J. Clin. Exp. Hypn. 54 (2) (2006) 143–166, https://doi.org/10.1080/00207140500528240.
[137] J.P. Green, S.J. Lynn, Cognitive-behavioral Therapy, Mindfulness, and Hypnosis for Smoking Cessation: A Scientifically Informed Intervention, John Wiley & Sons, 2018.
[138] P.D. Shenefelt, Mindfulness-based cognitive hypnotherapy and skin disorders, Am. J. Clin. Hypn. 61 (1) (2018) 34–44, https://doi.org/10.1080/00029157.2017.1419457.
[139] E. Pujiati, M. Dwidiyanti, M.A.U. Sofro, M.H. Gasem, The effectiveness of combination mindfulness spiritual-based cognitive therapy plus hypnosis vs mindfulness-based cognitive therapy on depression scores and cortisol levels in HIV patients with depression: a randomized controlled trial, NeuroQuantology 21 (1) (2023) 16, https://doi.org/10.48047/nq.2023.21.01.NQ20001.
[140] E. Jacobson, The origins and development of progressive relaxation, J. Behav. Ther. Exp. Psychiatr. 8 (2) (1977) 119–123, https://doi.org/10.1016/0005-7916(77)90031-3.
[141] D.A. Bernstein, T.D. Borkovec, Progressive Relaxation Training: A Manual for the Helping Professions, 1973.
[142] W.H. Connor, Effects of brief relaxation training on autonomic response to anxiety-evoking stimuli, Psychophysiology 11 (5) (1974) 591–599, https://doi.org/10.1111/j.1469-8986.1974.tb01119.x.
[143] R.K. Wallace, Physiological effects of transcendental meditation, Science 167 (3926) (1970) 1751–1754, https://doi.org/10.1126/science.167.3926.1751.
[144] J.L. Singer, Imagery and Daydream Methods in Psychotherapy and Behavior Modification, Academic Press, 1974.
[145] D. Vaitl, N. Birbaumer, J. Gruzelier, G.A. Jamieson, B. Kotchoubey, A. Kubler, et al., Psychobiology of altered states of consciousness, Psychol. Bull. 131 (1) (2005) 98–127, https://doi.org/10.1037/0033-2909.131.1.98.
[146] D. Geagea, B. Griffin, R. Kimble, V. Polito, D.B. Terhune, Z. Tyack, Hypnotherapy for procedural pain, itch, and state anxiety in children with acute burns: a feasibility and acceptability study protocol, Pilot Feasibility Stud 8 (1) (2022) 1–18, https://doi.org/10.1186/s40814-022-01017-z.
[147] R.R. Reilley, D.W. Parisher, A. Carona, N.W. Dobrovolsky, Modifying hypnotic susceptibility by practice and instruction, Int. J. Clin. Exp. Hypn. 28 (1) (1980) 39–45, https://doi.org/10.1080/00207148008409826.
[148] M.J. Batty, S. Bonnington, B.K. Tang, M.B. Hawken, J.H. Gruzelier, Relaxation strategies and enhancement of hypnotic susceptibility: EEG neurofeedback, progressive muscle relaxation and self-hypnosis, Brain Res. Bull. 71 (1–3) (2006) 83–90, https://doi.org/10.1016/j.brainresbull.2006.08.005.
[149] A. Capafons, Clinical applications of 'waking'hypnosis from a cognitive-behavioural perspective: from efficacy to efficiency, Contemp. Hypn. 21 (4) (2004) 187–201, https://doi.org/10.1002/ch.306.
[150] D.M. Wark, Alert hypnosis: a review and case report, Am. J. Clin. Hypn. 48 (4) (2006) 291–300, https://doi.org/10.1080/00029157.2006.10401536.
[151] R.J. Brown, E. Antonova, A. Langley, D.A. Oakley, The effects of absorption and reduced critical thought on suggestibility in an hypnotic context, Contemp. Hypn. 18 (2) (2001) 62–72, https://doi.org/10.1002/ch.220.
[152] C. Caldwell, H.K. Victoria, Breathwork in body psychotherapy: towards a more unified theory and practice, Body Mov. Dance Psychother. 6 (2) (2011) 89–101, https://doi.org/10.1080/17432979.2011.574505.
[153] E. Sointu, The search for wellbeing in alternative and complementary health practices, Sociol. Health Illness 28 (3) (2006) 330–349, https://doi.org/10.1111/j.1467-9566.2006.00495.x.
[154] G. Elkins, J. Marcus, M.H. Rajab, S. Durgam, Complementary and alternative therapy use by psychotherapy clients, Psychotherapy 42 (2) (2005) 232–235, https://doi.org/10.1037/0033-3204.42.2.232.
[155] S. Grof, The Adventure of Self-Discovery: Dimensions of Consciousness and New Perspectives in Psychotherapy and Inner Exploration, Suny Press, 1988.
[156] S. Grof, Psychology of the Future: Lessons from Modern Consciousness Research, SUNY Press, 2000.
[157] S. Grof, in: Ebscohost ProQuest (Ed.), Holotropic Breathwork a New Approach to Self-Exploration and Therapy, State University of New York Press, Albany, 2010.
[158] B.W. Scotton, A.B. Chinen, J.R. Battista, Textbook of Transpersonal Psychiatry and Psychology, Perseus (for Hbg), 1996.
[159] D.M. La Flamme, Holotropic breathwork and altered states of consciousness, Diss. Abstr. Int. 55 (2-B) (1995) 597.
[160] N.A. Agadzhanyan, M.I. Panina, G.S. Kozupitsa, O.S. Sergeev, Subjective and neurological manifestations of hyperventilation states of different intensities, Hum. Physiol. 29 (4) (2003) 448–452, https://doi.org/10.1023/a:1024929523667.
[161] J.P. Rhinewine, O.J. Williams, Holotropic Breathwork: the potential role of a prolonged, voluntary hyperventilation procedure as an adjunct to psychotherapy, J. Alternative Compl. Med. 13 (7) (2007) 771–776, https://doi.org/10.1089/acm.2006.6203.
[162] A.J. Rock, N.C. Denning, K.P. Harris, G.I. Clark, D. Misso, Exploring holotropic breathwork: an empirical evaluation of altered states of awareness and patterns of phenomenological subsystems with reference to transliminality, J. Transpers. Psychol. 47 (1) (2015).
[163] P. Kaiser, Childhood anxiety, worry, and fear: individualizing hypnosis goals and suggestions for self-regulation, Am. J. Clin. Hypn. 54 (1) (2011) 16–31, https://doi.org/10.1080/00029157.2011.575965.
[164] D.E. Nichols, Psychedelics. Pharmacol Rev. 68 (2) (2016) 264–355, https://doi.org/10.1124/pr.115.011478.
[165] K.H. Preller, F.X. Vollenweider, Phenomenology, Structure, and Dynamic of Psychedelic States, 2016, pp. 221–256.
[166] R.R. Griffiths, W.A. Richards, M.W. Johnson, U.D. McCann, R. Jesse, Mystical-type experiences occasioned by psilocybin mediate the attribution of personal meaning and spiritual significance 14 months later, J. Psychopharmacol. 22 (6) (2008) 621–632, https://doi.org/10.1177/0269881108094300.
[167] C. McLean, How the mind/body connection can empower children during painful procedures in hospital, Aust. J. Clin. Exp. Hypn. 29 (1) (2008) 23–27.
[168] Y. Schmid, M.E. Liechti, Long-lasting subjective effects of LSD in normal subjects, Psychopharmacology 235 (2) (2018) 535–545, https://doi.org/10.1007/s00213-017-4733-3.
[169] R.L. Carhart-Harris, D. Erritzoe, T. Williams, J.M. Stone, L.J. Reed, A. Colasanti, et al., Neural correlates of the psychedelic state as determined by fMRI studies with psilocybin, Proc. Natl. Acad. Sci. U. S. A. 109 (6) (2012) 2138–2143, https://doi.org/10.1073/pnas.1119598109.
[170] R.L. Carhart-Harris, S. Muthukumaraswamy, L. Roseman, M. Kaelen, W. Droog, K. Murphy, et al., Neural correlates of the LSD experience revealed by multimodal neuroimaging, Proc. Natl. Acad. Sci. U. S. A. 113 (17) (2016) 4853–4858, https://doi.org/10.1073/pnas.1518377113.
[171] D.B. de Araujo, S. Ribeiro, G.A. Cecchi, F.M. Carvalho, T.A. Sanchez, J.P. Pinto, et al., Seeing with the eyes shut: neural basis of enhanced imagery following Ayahuasca ingestion, Hum. Brain Mapp. 33 (11) (2012) 2550–2560, https://doi.org/10.1002/hbm.21381.
[172] R. Kraehenmann, K.H. Preller, M. Scheidegger, T. Pokorny, O.G. Bosch, E. Seifritz, et al., Psilocybin-induced decrease in amygdala reactivity correlates with enhanced positive mood in healthy volunteers, Biol. Psychiatr. 78 (8) (2015) 572–581, https://doi.org/10.1016/j.biopsych.2014.04.010.
[173] E. Tagliazucchi, L. Roseman, M. Kaelen, C. Orban, S.D. Muthukumaraswamy, K. Murphy, et al., Increased global functional connectivity correlates with LSD-induced ego dissolution, Curr. Biol. 26 (8) (2016) 1043–1050, https://doi.org/10.1016/j.cub.2016.02.010.

[174] R.L. Carhart-Harris, G.M. Goodwin, The therapeutic potential of psychedelic drugs: past, present, and future, Neuropsychopharmacology 42 (11) (2017) 2105–2113, https://doi.org/10.1038/npp.2017.84.
[175] C.M. Reiff, E.E. Richman, C.B. Nemeroff, L.L. Carpenter, A.S. Widge, C. I. Rodriguez, et al., Psychedelics and psychedelic-assisted psychotherapy, Am. J. Psychiatr. 177 (5) (2020) 391–410, https://doi.org/10.1176/appi.ajp.2019.19010035.
[176] B. Kelmendi, A.P. Kaye, C. Pittenger, A.C. Kwan, Psychedelics. Curr Biol. 32 (2) (2022) R63–R67, https://doi.org/10.1016/j.cub.2021.12.009.
[177] D. Nutt, D. Erritzoe, R. Carhart-Harris, Psychedelic psychiatry's brave new world, Cell 181 (1) (2020) 24–28, https://doi.org/10.1016/j.cell.2020.03.020.
[178] C.E. Lemercier, D.B. Terhune, Psychedelics and hypnosis: commonalities and therapeutic implications, J. Psychopharmacol. 32 (7) (2018) 732–740, https://doi.org/10.1177/0269881118780714.
[179] R.L. Carhart-Harris, M. Kaelen, M.G. Whalley, M. Bolstridge, A. Feilding, D. J. Nutt, LSD enhances suggestibility in healthy volunteers, Psychopharmacology 232 (4) (2015) 785–794, https://doi.org/10.1007/s00213-014-3714-z.
[180] B.M. Sjoberg Jr., L.E. Hollister, The effects of psychotomimetic drugs on primary suggestibility, Psychopharmacologia 8 (4) (1965) 251–262, https://doi.org/10.1007/BF00407857.
[181] J. Levine, A.M. Ludwig, Alterations in consciousness produced by combinations of LSD, hypnosis and psychotherapy, Psychopharmacologia 7 (2) (1965) 123–137, https://doi.org/10.1007/BF00403635.
[182] D.R. Patterson, S.A. Wiechman, M. Jensen, S.R. Sharar, Hypnosis delivered through immersive virtual reality for burn pain: a clinical case series, Int. J. Clin. Exp. Hypn. 54 (2) (2006) 130–142, https://doi.org/10.1080/00207140500528182.
[183] D.R. Patterson, M. Jensen, S. Wiechman, S. Sharar, Virtual reality hypnosis for pain associated with recovery from physical trauma, Int J Clin Exp Hypn [Internet] 58 (3) (2010) 288–300. Available from: https://www.cochranelibrary.com/central/doi/10.1002/central/CN-00751523/full.
[184] E.K. Okur kavak, G. Van Berlaer, M. Diltoer, M. Malbrain, Medical hypnosis and virtual reality glasses are safe and effective tools to alleviate pain and anxiety in patients undergoing medical procedures, Crit. Care 24 (2020), https://doi.org/10.1186/s13054-020-2772-3.
[185] J. Stinson, J. Yamada, A. Dickson, J. Lamba, B. Stevens, Review of systematic reviews on acute procedural pain in children in the hospital setting, Pain Res. Manag. 13 (1) (2008) 51–57, https://doi.org/10.1155/2008/465891.
[186] M. Gillum, S. Huang, Y. Kuromaru, J. Dang, H.A. Yenikomshian, T.J. Gillenwater, Nonpharmacologic management of procedural pain in pediatric burn patients: a systematic review of randomized controlled trials, J. Burn Care Res. 43 (2) (2022) 368–373, https://doi.org/10.1093/jbcr/irab167.
[187] N.J. Brown, R.M. Kimble, S. Rodger, R.S. Ware, L. Cuttle, Play and heal: randomized controlled trial of Ditto intervention efficacy on improving re-epithelialization in pediatric burns, Burns 40 (2) (2014) 204–213, https://doi.org/10.1016/j.burns.2013.11.024.
[188] G.M. Curran, M. Bauer, B. Mittman, J.M. Pyne, C. Stetler, Effectiveness-implementation hybrid designs: combining elements of clinical effectiveness and implementation research to enhance public health impact, Med. Care 50 (3) (2012) 217–226, https://doi.org/10.1097/MLR.0b013e3182408812.
[189] I. Kirsch, G. Montgomery, G. Sapirstein, Hypnosis as an adjunct to cognitive-behavioral psychotherapy: a meta-analysis, J. Consult. Clin. Psychol. 63 (1995) 214–220, https://doi.org/10.1037/0022-006X.63.2.214.
[190] M Rostami, P Ehteshamzade, P Asgari, Effectiveness of cognitive hypnotherapy in enhancing executive functions of obese women: a clinical trial, J. Gorgan Univ. Med. Sci. 25 (1).
[191] AJ Starosta, CH Bombardier, F Kahlia, J Barber, MC Accardi-Ravid, SA Wiechman, DA Crane, MP Jensen, Feasibility of brief, hypnotic enhanced cognitive therapy for SCI-related pain during inpatient rehabilitation, Arch. Phys. Med. Rehabil., doi:10.1016/j.apmr.2023.06.005.
[192] P. Sabherwal, N. Kalra, R. Tyagi, A. Khatri, S. Srivastava, Hypnosis and progressive muscle relaxation for anxiolysis and pain control during extraction procedure in 8–12-year-old children: a randomized control trial, Eur. Arch. Paediatr. Dent. 22 (5) (2021) 823–832, https://doi.org/10.1007/s40368-021-00619-0.