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Research paper

Hypnosis therapy for self-esteem in pediatric neurology practice: A pilot exploratory study

Margaux Hazard[a,b], Maximilien Perivier[a,b,c], Charly Gaisne[a], Rime Hicham[a], Pierre Castelnau[a,b,c,d,e,*]

[a] *Pediatric Neurology Unit, Clocheville Hospital, CHRU Tours, F-37000 France*
[b] *Excellence Autism Center-Tours (EXAC-T), CHRU Tours, F-37000 France*
[c] *Reference Center for Language and Learning Disorders (CRTLA), Clocheville Hospital, CHRU Tours, F-37000 France*
[d] *Inserm, U1253, iBrain Tours, F-37000 France*
[e] *François Rabelais University, Tours, F-37000 France*

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ABSTRACT

Background: A number of pediatric conditions are chronic, such as attention-deficit/hyperactivity disorder (ADHD), idiopathic epilepsies, or anxiety disorder. They all have an impact on self-esteem with consequences on the quality of life. Hypnosis is a therapeutic strategy that consists in putting into trance an individual who becomes receptive to appropriate suggestions. Such an approach is now considered a simple and safe therapy with limited cost. The aim of the present study was to show the feasibility of hypnosis for improving self-esteem in children with the aforementioned conditions.
Methods: We conducted a single-center study with prospectively collected data during routine care. Patients with ADHD, idiopathic epilepsies, or anxiety disorder and a low self-esteem were included between April 2018 and February 2020. They all underwent the same hypnosis protocol conducted by the same therapist. Self-esteem was assessed using two self-evaluation scales, the Jodoin 40 scale and Piers–Harris Self-Concept Scale, and a self-assigned self-esteem score at the beginning and at the end of the hypnosis session.
Results: Among the 14 children included, 11 were studied (6 ADHD, 1 anxiety disorder, 4 idiopathic epilepsies). The median age at inclusion was 12.2 years and the sex ratio was 4:3 (boys:girls). Final comparisons showed that self-esteem had improved, which was statistically significant regarding the Jodoin 40 scale and the self-assigned self-esteem score ($p \leq 0.05$). Neither side effect nor disease worsening was observed.
Conclusion: This study illustrates the feasibility of therapeutic hypnosis in clinical practice for improving self-esteem in chronic pediatric conditions.

Introduction

Pediatric neurology is a growing field of pediatrics in which the variety of disorders is expanding. Many of them are chronic: idiopathic epilepsies, migraine, neurodevelopmental disorders including attention-deficit/hyperactivity disorder (ADHD), learning disabilities, and neuropsychiatric conditions such as anxiety disorder.

Altogether, such disorders have in common a major impact on self-esteem (SE) development, which often worsens over time [1–3]. In 1967, Coopersmith defined SE as a person's approval or disapproval toward themselves [4]. It encompasses various life areas such as friendships, physical appearance, and social or work skills. It has been largely reported that a low SE may lead to (a) low quality of life (QoL), (b) academic failure, (c) subsequent difficulties to access professional accomplishment [5,6], and even (d) increase the risk of substance abuse and suicide [7,8].

Due to the heavy burden of these lifelong disorders for the patients and their families' daily life, the medical community usually follows up the QoL. Nevertheless, low SE remains an underscored issue, while, since the early works of Coppersmith, several authors have developed a large variety of scales for studies on this topic: either for age/class group or for individuals, with or without reference value, such as the Jodoin 40 scale, the Piers–Harris Children's Self-Concept Scale, or the Rosenberg Self-Esteem Scale [9,10].

Among the aforementioned chronic disorders, we selected three for which SE appears to be particularly altered in our experience.

Approximately 25 % of children with epilepsy are affected by idiopathic epilepsies, which include childhood absence epilepsy, juvenile absence epilepsy, juvenile myoclonic epilepsy, and generalized tonic–clonic seizures [11,12].

* Corresponding author at: Service de Neuropédiatrie et Handicaps, Hôpital d'Enfants Gatien de Clocheville, CHRU & Université de Tours, 49 Bd Béranger, Tours cedex 01, 37044, France.
E-mail address: castelnau@univ-tours.fr (P. Castelnau).

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ADHD is found in 3–5 % of school-aged children in the general population with a 3:1 male-to-female ratio [8,13]. According to the *Diagnostic and Statistical Manual of Mental Disorders*, Fifth Edition (DSM-5) criteria, symptoms (a) should appear before 12 years of age, (b) combine attention deficit and/or hyperactivity–impulsivity, and (c) impact at least two or more areas of daily life (school, home, friends, etc.).

Anxiety disorders encompass extensive anxiety, physiological anxiety symptoms, and behavioral disturbances such as extreme avoidance of feared objects, and associated distress or impairment. They are described and classified in the DSM-5 [14].

Strikingly, although many studies describe the low-SE-related comorbidities, there is almost no study addressing the best ways to restore an appropriate SE level. To date, and as far as we know, no pharmacological compound enables this to be done.

The therapeutic properties of hypnosis have been reported for several centuries, and since the beginning of the 20th century hypnosis has been increasingly used for medical purposes. According to the skilled observations of several distinguished clinicians over the past, such as Milton Erickson or François Roustang, and many recent cerebral functional imaging studies [15,16], hypnosis is now considered to provide a unique opportunity to communicate with the patient's mind and with its natural capacities to change or recover. Today, so-called Ericksonian hypnosis is a conversational therapeutic strategy that uses appropriate therapist suggestions to guide the patient, who may change and thereby have access to a better QoL. Hypnosis has been used in various fields, notably analgesia, phobia [17], or addiction[18], and appears to be a simple, rapid, reproducible, and safe [19] therapeutic strategy with limited cost [20]. Therefore, we studied hypnosis to restore SE in the context of our selected pediatric chronic disorders. Our primary objective was to verify the feasibility of hypnosis for improving SE in children with common neurological disorders. This study further presents two SE scales that can be used in many fields of pediatric care.

Materials and methods

Design and settings

We conducted a single-center, open, and uncontrolled exploratory study in a pediatric university hospital. The data were collected prospectively following a routine-care research design where each of the patients included received the same standardized protocol based on hypnosis.

Population

We included children and adolescents followed up by our pediatric neurology team and who had epilepsy, ADHD, or anxiety disorder as well as a low SE suspected by skilled physicians during routine care.

Patients were recruited between April 2018 and February 2020. The initial inclusion period was planned until May 2020 but finally stopped in February because of the COVID-19 lockdown.

Patients with ADHD had a diagnosis following the DSM-5 criteria and confirmed by neuropsychological tests including intelligence monitoring using the Wechsler Intelligence Scale for Children-IV or V (WISC-IV or WISC-V) and attentional and executive functions assessment by the Test of Everyday Assessment of Children (TEA-Ch) [21] or the Neuropsychological Assessment–Second Edition (NEPSY-II) [22].

We also included children and adolescents with idiopathic epilepsies, as defined by the International League Against Epilepsy (ILAE) classification [12], and anxiety disorder as defined by the DSM-5 criteria [14].

We excluded children with (a) intellectual disability, (b) brain lesions or genetic underlying pathology, (c) somatoform conditions, and (d) unbalanced epilepsy or (e) presenting with psychosocial issues that might have impaired the protocol commitment and/or interpretation of the results.

Protocol

For each patient, the therapist used the same standardized hypnosis protocol, which includes seven sessions during a period of 3 months. After an initial introductory session, five sessions focused on formal hypnosis. Formal hypnosis requires the patient's agreement and participation in a procedure including a preliminary induction phase followed by the trance phase itself where the increased suggestibility of the patient is obtained and valued. The procedure included an induction phase to promote cognitive dissociation. During the induction phase, the therapist encouraged the patient to focus their attention on each of the sensory channels while promoting relaxation and cognitive dissociation [23]. During the trance phase, SE improvement was suggested through standardized therapeutic suggestions nested in metaphorical tales (Supplementary file S1). Then a final phase allowed the patient to return to a normal state of consciousness including post-hypnotic suggestions. Each session of the protocol corresponds to a specific metaphoric fairy-tale triggering SE. For each session, the trance quality was assessed by the therapist through regular signs such as (a) breathing rate, (b) eye movements, (c) deglutition movements, and (d) muscle relaxation. A seventh final session was performed 1 month later to complete the SE scales and collect both the patient and parental testimonies.

Outcomes

Our primary objective was to assess a change in the patient's SE before and after our intervention. After a preliminary screening of various SE scales and to increase the robustness of our evaluations, we chose two self-assessment scales validated in French for children and adolescents: the Jodoin 40 Scale and the Piers–Harris Children's Self-Concept Scale. Both were completed during the first and the last session by each patient.

The Jodoin scale is a Canadian francophone scale of 68 items originally proposed by S. Jodoin in 1976 [9]. In 1994, O. Lamy proposed a shorter and validated version of 40 items. The so-called Jodoin 40 scale was established to self-assess SE in children and adolescents and explore four subcategories of SE: "subject," "parents," "school and teacher," and "peers." The answers were binary (*yes*/*no*) and led a rated score out of 40 [10]. A version of the Jodoin 40 Scale adapted for French children is proposed as supplemental data (Supplementary file S2)

The Piers–Harris Children's Self-Esteem Scale was also designed to assess SE in children. This is a scale of 80 questions that explore six subcategories of SE—"behavior," "school," "quality and appearance," "anxiety," "popularity," "joy and satisfaction"—through binary answers (*yes*/*no*) [24]. A francophone version of the Piers–Harris Children's Self-Esteem Scale is proposed as supplemental data (Supplementary file S3)

We also asked each patient to quantify their own SE level by assigning it a score (self-assigned SE score, SESS) from 0 to 10 during the first and the last sessions.

Statistical analysis

Quantitative data are expressed as median (interquartile range [IQR]) and categorical data as frequency (percentage).

We checked the internal validity of the Jodoin 40 Scale and Piers–Harris Children's Self-Esteem Scale data through a Cronbach's alpha test.

To address our primary objective, we compared the scores of the scales before and after the hypnosis intervention using a Wilcoxon test where a value of $p \leq 0.05$ was considered statistically significant. All analyses were performed with the statistical software R and BiostaTGV.

Ethics

Given our study design, there was no requirement for the patients' consent, according to the French legislation (Loi Jardé). Our databases of neuropediatric patients were declared to the French National Committee for Data Protection (*Commission Nationale Informatique et Liberté* [CNIL], declarations 2017_098 and 2017_087).

Results

Characteristics of the population

We included a total of 14 children. Among them, seven had idiopathic epilepsies, six had ADHD, and one had an anxiety disorder. Table 1 displays the characteristics of the population studied. Eight of the patients were males (57.1 %) with a median age of 12.2 [11; 13.4] years at inclusion. Thus, we considered that the population studied was representative of the patients usually followed up in pediatric neurology practice. All the patients with epilepsy had genetic generalized epilepsies (GGE), namely, one patient with myoclonic juvenile epilepsy, two patients with juvenile absence epilepsy, and one with epilepsy with generalized tonic–clonic seizures alone. All epilepsies were controlled.

No other SE rehabilitation was proposed, neither before nor during the hypnosis protocol. Five patients underwent psychotherapy, which was still going on during the study: four patients with epilepsy and the patient who had an anxiety disorder.

Feasibility of hypnosis interventions and of outcome measures

The therapist reported that each patient underwent hypnotic trance at each session. None of the patients quit the protocol. However, because of the COVID-19 lockdown, three patients with epilepsy did not complete the entire protocol and therefore we could not analyze their data.

We ran our final analysis on data from 11 patients, as displayed in Fig. 1. For the remaining patients, each Jodoin 40 SE Scale was fully completed by each child before and after the protocol without missing data. Cronbach's alpha value, assessing the internal consistency of our scale, was 0.544, which is above the acceptable limit of 0.5. For the Piers–Harris Children's Self-Esteem Scale, one questionnaire was missing, and Cronbach's alpha value was 0.897. For the SE score, we had two missing scores, one before and one after the protocol.

Therefore, under these circumstances, such a hypnosis protocol provided a good level of feasibility and acceptance in a non-trained pediatric population.

Table 1
Characteristics of the study population (n = 14).

Characteristics	*N* (%)
Gender	
Boy	8 (57.1)
Girl	6 (42.9)
Median age at inclusion [IQR] (*years*)	12.2 [11;13.4]
Median age at diagnosis [IQR] (*years*)	10.2 [7.9;11.8]
Educational level	
Primary school	3 (21.4)
High school *(collège)*	9 (64.3)
High school *(lycée)*	1 (0.7)
Drugs	
Methylphenidate	5 (83)
Anti-seizure (lamotrigine or valproate)	7 (100)
Non-pharmacological interventions	
Psychotherapy	5 (35.7)
Speech therapy	2 (14.3)

IQR: interquartile range.

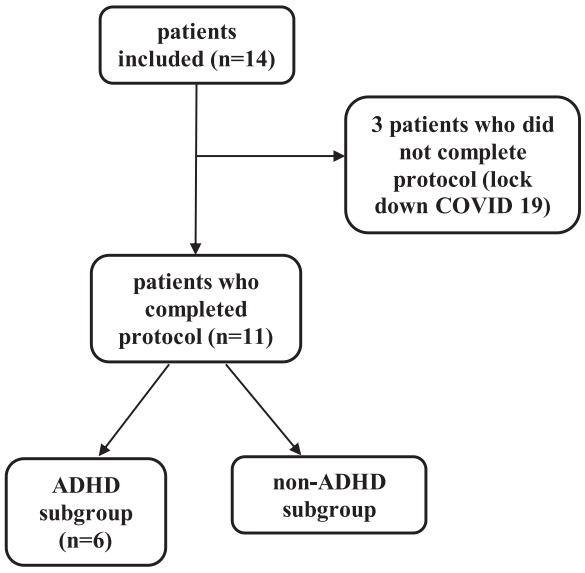

Fig. 1. Flowchart.
ADHD: attention-deficit/hyperactivity disorder.

Self-assessed SE before and after hypnosis

In our study, the three evaluation criteria suggest SE improvement before and after the hypnosis protocol.

Table 2 displays the results of the Jodoin 40 scale before and after hypnosis. The comparison between the total median score of 8 [4; 13] before hypnosis and of 18 [13.5; 23] after hypnosis was statistically significant (p = 0.011), as shown in Fig. 2a. The differences before and after hypnosis for the Jodoin 40 Scale subscores were not statistically significant, as shown in Fig. 2b.

Analysis of the Piers–Harris Children's Self-Esteem Scale did not reveal any statistical difference; however, the medians tended to increase with a median total score of 52.5 [46.5; 65.5] before hypnosis and of 59.5 [53; 64.5] after hypnosis (p = 0.286), as displayed in Table 3.

The SE score showed a statistically significant increase, with a median score of 5.5 [4.25; 6.25] before hypnosis and of 7 [6; 8] after hypnosis (p = 0.014).

Discussion

The aim of the present study was to explore the use of hypnosis in common neurological pediatric disorders. These preliminary data confirm the feasibility of hypnosis in SE management. As far as we know, this is the first study in this field to date.

Under the circumstances of our hypnosis protocol, the three evaluation tools selected showed SE improvement. For two of them, the Jodoin 40 Scale and the SE score, statistical significance was achieved. The results of the Piers–Harris Children's Self-Esteem Scale were not significant but the median of the total score increased before and after hypnosis, which is consistent with the results obtained with the two other evaluation tools. These results are in line with a series of studies conducted in pediatric practice [17]. Thus, it is likely that hypnosis might be a valuable method for improving SE in children.

Table 2
Jodoin 40 Scale results before and after hypnosis ($n = 11$).

	Before hypnosis (*Median [IQR]*)	**After hypnosis** (*Median [IQR]*)	***P*** (*Wilcoxon test*)
Total (/40)	**8 [4; 13]**	**18 [13.5; 23]**	**0.01***
Subject	−2 [−3; 1]	2 [0; 5]	0.05*
Parents	5 [1; 6.5]	7 [5; 9]	0.06
School and teacher	3 [1; 4]	3 [3; 7]	0.14
Peers	6 [2; 6]	6 [4; 9]	0.22

* $p \leq 0.05$ showing statistical difference.
IQR: interquartile range.

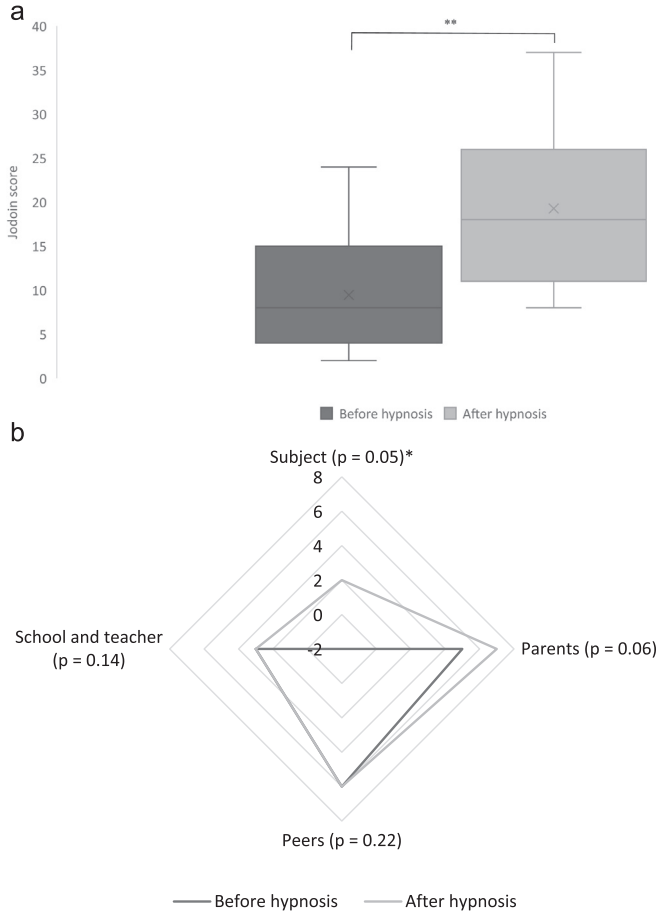

Fig. 2. a. Box and whisker chart: Jodoin 40 Scale total score before and after hypnosis in our neuropediatric population. b. Median score in subcategories of the Jodoin 40 scale before and after hypnosis in our neuropediatric population.
The corresponding mean is indicated (x) above the median bar in each box.
*$p \leq 0.05$ showing statistical difference.

Our study followed the guidelines of the routine-care research design. Thus, a control group could not be included to this study to ensure that SE improvement was solely due to the hypnotic suggestions. However, a spontaneous improvement seems unlikely given that several studies showed how SE tends to decrease with age for patients with ADHD or idiopathic epilepsy [2,25]. Finally, we cannot completely exclude the fact that the repeated care and support provided during the follow-up could have been sufficient to improve SE.

Our study also followed an open design: The same therapist performs the child evaluation and the intervention. However, the self-evaluation method used should have limited such bias. In addition, the analysis of the results was made by an independent operator. The internal consistency of the Jodoin 40 Scale and Pier−Harris Children's Self-Esteem Scale was acceptable as assessed by Cronbach's alpha value.

In the context of SE, a methodology based on self-evaluation raises the issue of a "response shift" phenomenon where the patient's perception of the assessment tools may vary over time due to the therapeutic intervention. This is particularly critical in our study since metacognition and SE are highly linked [26]. It should be noted that this phenomenon is common to all self-evaluation scales used in cognitive and emotional research [27]. Therefore, such shifting may have underestimated the quantitative variations of our scales. It could explain the gap between the substantial SE benefit reported by the patients' parents and the therapists, and the moderate quantitative gains observed on SE scales. However, these quantitative gains, even moderate, reached statistical significance, and thus we conclude that the response shift phenomenon, if present, was not a critical bias in our study.

Our hypnosis protocol was easily implemented in our neuropediatric population. All children showed signs of hypnotic trance during the protocol, including patients with ADHD. Purposely, we did not test the patient's hypnotizability before the inclusion to be in keeping with the general population's conditions. Previous studies showed that children are highly hypnotizable [28]. This is consistent with our results and makes the pediatric population a good target for this therapeutic tool. There was no side effect and notably none of the patients with epilepsy suffered from a seizure during the protocol or directly after it. Therefore, under these circumstances, our hypnosis protocol did not show any noticeable side effect and may be easily reproduced. This protocol seemed to be efficient even after a few sessions only, compared to other methods such as psychotherapy. The children and adolescents are usually advised to practice self-hypnosis to sustain the protocol benefits. It should be noted that this therapeutic approach may be used without any preliminary training of the patient, in contrast with other strategies such as mindfulness. The limited cost of hypnosis is also an important issue to consider. As previously outlined by several authors, hypnosis is mainly based on ambulatory consultations, and does not require expensive technology or medication [20].

Many studies have shown that SE may be altered in chronic pediatric diseases. Over the past decade, several authors emphasized the need to include SE management in the follow-up of these disorders in order to improve patient outcome [1-3,29,30]. The neurodevelopment of SE occurs throughout childhood, which explains that SE represents a key issue in the pediatric age [31]. In the context of these pediatric chronic disorders, an important goal is to provide a relevant degree of autonomy to the patient. If the disability may not be fully suppressed, SE improvement may help to bypass the remaining handicap or symptoms and achieve personal and professional fulfillment.

In the current context of our society, there is a need for integrative, i.e., non-pharmaceutical, medicine based on the personal resources of the patients [32]. Even in complex and intensive care units like pediatric oncology, hypnosis is widely used because it has been shown to be effective in reducing chemotherapy-induced nausea and vomiting [33].

Table 3
Piers–Harris Children's Self-Esteem Scale results before and after hypnosis (n = 10).

	Before hypnosis (*Median [IQR]*)	**After hypnosis** (*Median [IQR]*)	***P*** (*Wilcoxon test*)
Total (/80)	**52.5 [46.5; 65.5]**	**59.5 [53; 64.5]**	**0.29**
Behavior	12 [11.25; 14.75]	13 [11.25; 14.75]	0.61
School	11 [10.25; 11]	11.5 [10.25; 13.5]	0.46
Quality and appearance	9 [8.25; 10]	10.5 [7.5; 11.75]	0.41
Anxiety	8 [4; 12]	9 [12.5; 12.5]	0.15
Popularity	8 [7; 9.75]	8 [7.25; 8.75]	0.77
Joy and satisfaction	7 [5.5; 8]	8.5 [7.25; 9]	0.08

*$p \leq 0.05$ showing statistical difference.
IQR: interquartile range.

Conclusion

Hypnosis, by improving SE, lessens the functional consequences of the disease and allows the adolescent to project themselves into their future as a normal individual and not as a chronic patient. Such an approach has been recently described by others in the pediatric field, in a wide range of common disorders including mental health conditions such as anxiety or posttraumatic stress disorder, psychophysiological disorders such as migraine or irritable bowel syndrome, or neurodevelopmental trouble such as written language disorder [17,30].

This is one of the fundamental characteristics of modern hypnosis and one of the main lessons taught by Milton Erickson and François Roustang [34,35]. It is very likely that many other pediatric subspecialties would benefit from the use of hypnosis to reinforce SE in the follow-up of their patients.

Declaration of Competing Interest

None.

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Supplementary materials

Supplementary material associated with this article can be found in the online version at doi:10.1016/j.arcped.2023.08.014.

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