

## Original Research Article

# Medical hypnotherapy; even in a tertiary care setting a promising treatment

Vanessa B. Bastek, Elroly M. Groeneveld, Michel J. van Vliet\*

Department of Social Pediatrics, Beatrix Children's Hospital, University Medical Center Groningen, University of Groningen, Netherlands

**Received:** 25 March 2022

**Revised:** 15 April 2022

**Accepted:** 18 April 2022

**\*Correspondence:**

Dr. Michel J. van Vliet,

E-mail: [m.j.van.vliet@umcg.nl](mailto:m.j.van.vliet@umcg.nl).

**Copyright:** © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

### ABSTRACT

**Background:** Medical hypnotherapy has shown to be an effective treatment in specified conditions such as abdominal pain or headache. Since 2016 the Beatrix children's hospital, a tertiary care center, offers medical hypnotherapy for a high variety of complex symptom disorders in pediatric patients.

**Methods:** This retrospective COHORT study analyzed the characteristics of pediatric patients treated with medical hypnotherapy in a tertiary care center as well as the effectiveness of the treatment.

**Results:** 214 patients with complex chronic symptoms were treated with medical hypnotherapy. 48% Percent of all patients referred had more than one symptom and 59% of them had had their symptoms for over a year. An overall improvement of symptoms was achieved in 76% of all patients.

**Conclusions:** Medical hypnotherapy seems an effective treatment for patients with multiple chronic and complex symptoms even in a tertiary clinical setting.

**Keywords:** Pediatrics, Children, Hypnotherapy, Tertiary care center, Pain management

### INTRODUCTION

According to the biopsychosocial model of health and illness, interactions between biological, psychological, and social factors determine the cause, manifestation, and outcome of health and disease.<sup>1-5</sup> Traditionally, pediatrics focuses on all these domains when treating children. With the introduction of 'positive health' in pediatrics, which defines health as 'a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity', mind-body health practices have gained popularity.<sup>6-8</sup> Within the group of mind-body health practices, medical hypnotherapy has shown to be one of the most effective techniques to treat children and is used as an adjunct to so-called conventional care for pediatric and adolescent patients.<sup>1,9</sup> Hypnotherapy can be used to teach coping skills and to adjust the patient's beliefs in

their favor. It also allows the development of new pain management strategies and a reprocessing of psychodynamic emotional factors.<sup>3,5,9</sup> Functional or organic pain at a young age often leads to chronic pain with psychosocial co-morbidities in adulthood.<sup>10,11</sup> Therefore, an extra advantage of starting treatment early is the possible prevention of the long-term consequences that pain syndromes in childhood can have.

Medical hypnotherapy has shown to significantly improve abdominal pain in pediatric patients, such as in functional abdominal pain (FAPs) and irritable bowel syndrome (IBS).<sup>12-16</sup> There is also increasing evidence that hypnotherapy is beneficial in numerous other chronic pain conditions such as headaches, (e.g. needle-related) short-procedural pain, chronic dyspnea and asthma.<sup>17-29</sup> However, most of these studies focused on strictly

defined symptoms, diseases or disorders.<sup>14-18,25,26</sup> These results are not one on one applicable to patients referred to tertiary care centers with complex chronic pain syndromes or psychosomatic disorders who most often have multiple symptoms. We are the first to describe a population of patients in a tertiary care setting in which all patients are offered treatment regardless of their type and amount of symptoms. Moreover, we show that even in these patients with complex (pain) disorders medical hypnotherapy seems a feasible (add-on) treatment.

## METHODS

### Study design

A single-center retrospective, observational cohort study was conducted at the department of social pediatrics at the Beatrix children's hospital of the university medical center Groningen (UMCG), a tertiary teaching hospital in the Netherlands. All patients aged between 5 and 17 years who were referred for medical hypnotherapy treatment between November 2016 and May 2020 were included in the study; there were no exclusion criteria. The study protocol was reviewed by the medical ethics review board of the university medical center Groningen and was conducted in compliance with their requirements. The primary goal of this study was to describe the characteristics of pediatric patients referred to and treated in a tertiary care setting with hypnotherapy. The secondary goal of this study was to evaluate the therapy's effectiveness based on patient-reported reduction of symptoms.

### Therapy procedure

Before starting treatment, all patients had a consultation with a pediatrician specialized in medical hypnotherapy. During this consultation eligibility for hypnotherapy was tested. The biopsychosocial model and the sensitization model were explained while also the concept and mechanism of hypnotherapy were clarified. Hereafter, patients received an appointment with the medical hypnotherapist. During this appointment the biopsychosocial model and the sensitization model were explained again. Moreover, concepts about the power of words and focus, as well as its effect on symptoms were illustrated. The hypnotherapist introduced the first hypnotherapy exercises (E. Jacobson and bubble blower) to the patient. The patients were asked to practice daily. For this purpose, they received several audio exercises. Furthermore, parents and caregivers received the task not to address their child's complaints or ask about pain at home. In the second consultation with the hypnotherapist, firstly experiences were discussed and afterwhile new exercises were introduced. In addition, the biopsychosocial and sensitization concept as well as concepts around hypnotherapy were repeated for the third time. All following consultations entailed new exercises and content that were individually tailored to the patient's symptoms and personality.

### Statistics

The data were collected by the treating health care professional in a completely anonymized database (2<sup>nd</sup> author). Information such as baseline characteristics, information about symptoms and treatment specifics were available. The data were analyzed by an independent researcher (1<sup>st</sup> author). In order to simplify the analyses despite the variety of symptoms, patients' symptoms were categorized into symptom subgroups (Table 1).

**Table 1: Patient symptom subgroups.**

Patient symptom subgroup	Group	Symptoms
<b>Gastrointestinal symptoms</b>	1	Stomach or bowel problems, gastro-esophageal reflux, nausea
<b>Neurological symptoms</b>	2	Headaches, functional neurological disorders, syncope, dizziness, dysregulated pain-feedback, pain in the extremities or joints
<b>Pulmonary symptoms</b>	3	Hyperventilation, asthma
<b>Fatigue &amp; trouble sleeping</b>	4	Fatigue, malaise, having low energy, trouble sleeping
<b>Fear of medical procedures</b>	5	Fear of injections, gastric tube exchange or other invasive procedures
<b>Other</b>	6	Psychosocial problems, urinary or defecation problems, eating or weight disorders, pain or itchiness in the genital region, back pain, other uncategorizable problems

To be able to evaluate the effectiveness of medical hypnotherapy treatment, patients' outcomes were categorized in five groups of effectiveness: A=symptom-free, B=barely any symptoms, C=improvement, D=no effect, E=effect unknown. If information about the effects of hypnotherapy was missing or not possible to categorize, patients were assigned to group E (effect unknown/treatment not applied). IBM SPSS Statistics 25 and Microsoft Excel Version 2016 were used to analyze the data. Results are presented as a mean  $\pm$  standard deviation (SD) if normally distributed or as a median with range if the data were skewed. Any dichotomous or categorical data are presented in fractions. The Kruskal-Wallis test was used for continuous outcome variables. For categorical outcome variables the Chi-Square or Fisher man's exact test was used.

## RESULTS

### Baseline characteristics

All 214 patients referred to the social pediatrics department of the Beatrix children's hospital who received medical hypnotherapy between November 2016 and May 2020 were included. In this study cohort, 70% (N=150) of patients were female and 30% (N=64) were male. Their mean age was  $12.4 \pm 3.6$  (2-18) years. The vast majority of patients experienced chronic symptoms. In total 59% (N=125) of patients had had symptoms for more than a year, and 47% (N=100) for even more than 2 years. Total 48% (N=103) of all patients had more than one symptom at the start of medical hypnotherapy treatment. Especially patients with fatigue and neurological complaints experienced multiple symptoms (77% resp. 60%), whereas patients with fear for medical procedures almost never experienced multiple symptoms (7%). Median duration of treatment was 4 (1-32) months and the median number of hypnotherapy sessions was 4 (1-20). During the period of medical hypnotherapy, 21% (N=45) of all patients were also receiving another form of treatment. Most patients (85%) were referred by (pediatric) medical specialists such as pediatric gastroenterologists, pediatric neurologists and pediatric cardiologists. A total of 16 different (pediatric) specialisms initiated referral. Only 15% of patients were referred by general practitioners (Table 3).

### Categorization of symptoms

As previously mentioned, patients were categorized into subgroups according to their symptoms (Table 1). Especially gastrointestinal (26%, N=56) and neurological symptoms (29%, N=62) were highly prevalent (Table 2).

### Completion of treatment

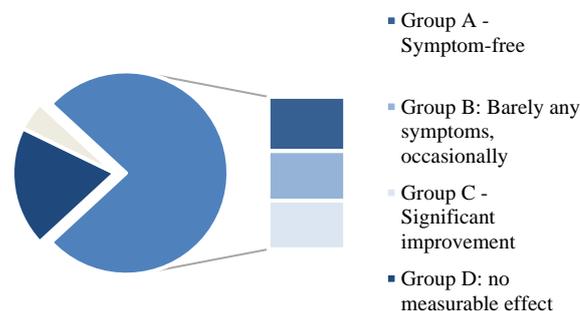
Of all patients, 95% (n=204) completed treatment. Reasons for not completing treatment were non-attendance (N=5), worsening of an underlying condition (N=2) and refusal of treatment (N=3).

### Effectiveness of hypnotherapy

A total of 76% (N=163) of patients (N=214) experienced an improvement of their condition after medical hypnotherapy treatment. Of these patients, 36% (N=58) were completely free of symptoms after completion of the treatment, 33% (N=53) just occasionally experienced symptoms and 32% (N=52) experienced at least an improvement of their symptoms (Figure 1). The effectiveness was largest in patients with gastrointestinal symptoms (89%) and pulmonary symptoms (83%). The success rate of the other groups ranged from 69% to 79% (Table 2). Of all male patients 81% (N=64) achieved a significant improvement of symptoms, whereas 74% (N=150) of the female patients significantly improved. Therapy effectiveness was not influenced by the number of symptoms (Chi-Square test:  $X^2(1)=2.473$   $p=0.116$ ).

## DISCUSSION

This retrospective cohort study in which all patients in our hospital eligible for medical hypnotherapy treatment were included, regardless of the type and amount of their symptoms, is the first study to reveal the characteristics of these patients with complex disorders and effectiveness of medical hypnotherapy in a tertiary care setting. The included patients belonged to a group of patients with complex diseases and symptoms. This is substantiated by the fact that 59% of patients had their symptoms for even more than a year, 85% had been referred by paediatric specialists, and 48% of patients had more than one symptom. The median treatment length of only 4 hypnotherapy sessions led to an improvement of symptoms in 76% (N=163) of all patients despite the number of their symptoms. Previous studies mainly focussed on one narrowly defined symptom or disorder.<sup>14-18,25,26</sup> In clinical practice, patients also present with comorbidities and multiple symptoms which is especially true in a tertiary care setting. When presenting in a university children's hospital, most children have already undergone a long medical journey across multiple care providers. Our study is the first to show that medical hypnotherapy is also effective in this population despite the complexity of the clinical picture, with a positive effect in the majority of patients (Figure 1).



**Figure 1: Effectiveness of medical hypnotherapy; (Group A: Symptom-free; Group B: Barely any symptoms, occasionally; Group C: Significant improvement; Group D: No improvement; Group E: Effect unknown/treatment not applied).**

In order to better compare our outcomes with literature we have created symptom subgroups. One of our groups entails patients with gastrointestinal symptoms. A relief of gastrointestinal symptoms through hypnotherapy has widely been researched,<sup>12-16</sup> and our results (88% success rate, group 1) are strongly in line with literature (80-85% success rates respectively).<sup>13,16</sup> This also accounts for our patients with pulmonary symptoms (83%). A study done in a paediatric pulmonary center by Anbar et al. achieved an improvement rate of 80%.<sup>26</sup> Furthermore, 79% of all patients with fear of medical procedures benefitted from treatment.

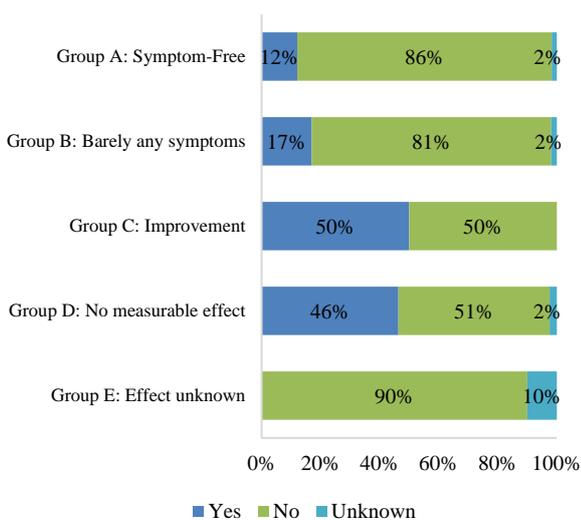
**Table 2: Subgroup analysis.**

Variables	Description	Total	Gastro-intestinal symptoms	Neurological symptoms	Pulmonary symptoms	Fatigue & trouble sleeping	Fear of medical procedures	Others	
<b>Baseline</b>	Subgroup number		1	2	3	4	5	6	
	N (%)	214 (100)	56 (26)	62 (29)	6 (3)	26 (12)	29 (14)	35 (16)	
	Age, years±SD	12.4±3.6	13.5±3.0	12.8±2.9	13.2±3.3	13.7±3.6	8.6±3.2	12.0±3.7	
	Gender (%)	Male	64 (30)	15 (27)	18 (29)	1 (17)	6 (23)	13 (45)	11 (31)
Female		150 (70)	41 (73)	44 (71)	5 (83)	20 (77)	16 (55)	24 (69)	
<b>Symptoms</b>	Amount of symptoms	Mean±SD	1.8±1.0	1.7±0.8	2.2±1.2	1.5±0.8	2.4±1.1	1.1±0.4	1.5±0.7
<b>Treatment</b>	Duration of treatment (months)	Median (Range)	4 (1-32)	3 (1-19)	4 (1-17)	3 (1-32)	6 (1-21)	2 (1-28)	4 (1-16)
	Number of hypnosis sessions		4 (1-20)	3 (1-9)	4 (1-15)	2.5 (1-10)	5 (1-8)	3 (1-6)	4 (1-20)
	Number of patients who received concomitant other treatment	N (%)	45 (21)	6 (11)	13 (21)	1 (17)	14 (54)	4 (14)	7 (20)
<b>Effective-ness of hypno-therapy treatment</b>	Improvement	Total, N (%)	163 (76)	49 (88)	44 (71)	5 (83)	18 (69)	23 (79)	24 (69)
		Group A	58 (27)	18 (32)	16 (26)	2 (33)	6 (23)	5 (17)	11 (31)
		Group B	53 (25)	22 (39)	13 (21)	2 (33)	4 (15)	8 (28)	4 (11)
		Group C	52 (24)	9 (16)	15 (24)	1 (17)	8 (31)	10 (34)	9 (26)
	No improvement	Group D	41 (19)	6 (11)	16 (26)	0 (0)	6 (23)	5 (17)	8 (23)
	Effect unknown/treatment not applied	Group E	10 (5)	1 (2)	2 (3)	1 (17)	2 (8)	1 (3)	3 (9)

Many studies, including a cochrane review, support these findings by reporting its efficacy and usefulness.<sup>19,21,22</sup> 71% of our patients with neurological symptoms, out of which 60% were suffering from headaches, have achieved favourable results with hypnotherapy. Literature states that the effectiveness of hypnotherapy ranges from 41% up to 96% for headaches.<sup>17,18,20</sup>

**Table 3: List of specialties that referred their patients to the social pediatrics department, i.a. for medical hypnotherapy.**

Referral to the social pediatrics department	Total	%
General pediatrician	74	34.6
General practitioner	33	15.4
Pediatric neurologist	29	13.6
Pediatric gastroenterologist	18	8.4
Social pediatrician	12	5.6
Pediatric hematologist	8	3.7
Pediatric endocrinologist	6	2.8
Pediatric cardiologist	6	2.8
Pediatric pulmonologist	6	2.8
Pediatric rheumatologist	5	2.3
Pediatric psychologist & pediatric psychiatrist	4	1.9
Pediatric surgeon	2	0.9
Pediatric nephrologist	2	0.9
Pediatric immunologist/infectiologist	2	0.9
Pediatric urologist	1	0.5
Pediatric gynecologist	1	0.5
Pediatric dermatologist	1	0.5
Clinical nurse specialist	1	0.5
Unknown/not applicable	3	1.4
<b>Total</b>	<b>214</b>	<b>100</b>



**Figure 2: Referral initiated after treatment.**

Literature states that the effectiveness of hypnotherapy ranges from 41% up to 96% for headaches.<sup>17,18,20</sup> Our study revealed that some symptoms are easier to treat than others with medical hypnotherapy (Table 2). The median number of hypnosis sessions for the whole cohort were 4 sessions (range 1-20) whilst fatigue symptoms required a median of 5 (range 1-8) and gastrointestinal symptoms a median of 3 sessions (range 1-9). There is no clear consensus about the optimal number of sessions. With gastrointestinal symptoms being mostly researched, many studies have used 6-7 sessions over a period of 3 months.<sup>15,16,30</sup> The more effective medical hypnotherapy was, the smaller the chance of further referral after completion of treatment (Figure 2). In general, 29% (N=61) of all patients were referred after completion of hypnotherapy treatment. Out of the group that experienced no effects of hypnotherapy 46% were referred (group D) whereas 12% of the symptom-free group (group A) were referred for further care. The latter was mostly caused by the disclosing of underlying psychosocial difficulties that needed further evaluation and treatment by other healthcare providers, such as psychologists.

**Limitations**

There were several limitations to the study. Even though the validity and generalizability of the results were enhanced by analysing the effect of hypnotherapy in a routine clinical practice, it also affected how the study was conducted. Patients enrolled in the start period had a longer follow-up period than patients enrolled in the end period which possibly affected the reported therapy's effectiveness. Moreover, this is a retrospective study and medical hypnotherapy was initiated as an add-on treatment next to other clinical treatments which might exemplify our results partly. Furthermore, our study outcome might be an overestimation of the general effectiveness due to the skillset of our hypnotherapist and doctor specialized in social pediatrics and hypnotherapy. Recent research suggests that offering audio exercises to patients instead of personalized treatment with medical hypnotherapy can be effective. With regards to gastrointestinal symptoms, Rutten et al. achieved a clinical remission in 36.8% in the CD-home based group right after treatment completion and a 62.1% remission rate after a 1-year follow up.<sup>15</sup> Our success rate was 88% for gastrointestinal symptoms after completion of treatment, which is comparable to the Vlieger et al. study in which a clinical remission 85% was achieved after a 1-year follow-up. Home-based CD-hypnotherapy is a standardized, inexpensive method that can reach a high number of patients. We believe that this approach suits first and second-line settings in which patient's symptoms have not yet exacerbated into complex clinical pictures such as frequently seen in tertiary care settings. For the latter, we hypothesize that individual medical hypnotherapy is necessary as rapport, defined as a trustful relationship between patient and therapist, is crucial for the success of treatment in these patients with highly

complex symptom disorders who have already had a long medical journey. That permits an unraveling of underlying toxic patterns and root causes in order to accordingly address these in our treatment and initiate further steps if necessary. More research is needed to compare individualized medical hypnotherapy to home-based CD-hypnotherapy in patients treated in a tertiary care setting.

## CONCLUSION

We describe a population of patients in a tertiary care setting treated with medical hypnotherapy. Effectiveness of therapy was above 75% for the group as a whole and ranged from 69% to 88% dependent on the category of symptoms. In conclusion, we show that in these patients with complex (pain) disorders medical hypnotherapy seems a feasible (add-on) treatment, independent of the type and amount of symptoms.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: The study was approved by the Institutional Ethics Committee*

## REFERENCES

- Delivet H, Dugue S, Ferrari A, Postone S, Dahmani S. Efficacy of self-hypnosis on quality of life for children with chronic pain syndrome. *Int J Clin Experiment Hypnosis.* 2018;66(1):43-55.
- Meints SM, Edwards RR. Evaluating psychosocial contributions to chronic pain outcomes. *Progress Neuro-psychopharmacol Biological Psychiat.* 2018; 87(2):168-82.
- Rogovik AL, Goldman RD. Hypnosis for treatment of pain in children. *Canad Family Physic.* 2007;53(5): 823-5.
- Rousseau-Salvador C, Amouroux R, Annequin D, Salvador A, Tourniaire B, Rusinek S. Anxiety, depression and school absenteeism in youth with chronic or episodic headache. *Pain Res Manag.* 2014; 19(5):235-40.
- Sawni A, Breuner CC. Clinical hypnosis, an effective mind-body modality for adolescents with behavioral and physical complaints. *Children.* 2017;4(4):19.
- Bangma JT, Kwiatkowski E, Psioda M, Santos HP, Hooper SR, Douglass L, et al. Understanding positive child health. *Pediatr Res.* 2019;86(6):690-1.
- Bethell C, Jones J, Gombojav N, Linkenbach J, Sege R. Positive childhood experiences and adult mental and relational health in a statewide sample: associations across adverse childhood experiences levels. *JAMA Pediatr.* 2019;173(11):e193007.
- Child health. Available at: <https://apps.who.int/iris/handle/10665/43134>. Accessed on 20 November 2021.
- Gonzales VA, Martelli MF, Baker JM. Psychological assessment of persons with chronic pain. *Neuro Rehab.* 2000;14(2):69-83.
- Vinall J, Pavlova M, Asmundson GJ, Rasic N, Noel M. Mental health comorbidities in pediatric chronic pain: a narrative review of epidemiology, models, neurobiological mechanisms and treatment. *Children.* 2016;3(4):40.
- Walker LS, Sherman AL, Bruehl S, Garber J, Smith CA. Functional abdominal pain patient subtypes in childhood predict functional gastrointestinal disorders with chronic pain and psychiatric comorbidities in adolescence and adulthood. *Pain.* 2012;153(9):1798-806.
- Anbar RD. Self-hypnosis for the treatment of functional abdominal pain in childhood. *Clin Pediatr.* 2001;40(8):447-51.
- Galili O, Shaoul R, Mogilner J. Treatment of chronic recurrent abdominal pain: laparoscopy or hypnosis?. *J Laparoendosc Adv Surg Tech.* 2009;19(1):93-6.
- Gulewitsch MD, Schlarb AA. Comparison of gut-directed hypnotherapy and unspecific hypnotherapy as self-help format in children and adolescents with functional abdominal pain or irritable bowel syndrome: a randomized pilot study. *Eur J Gastroenterol Hepatol.* 2017;29(12):1351-60.
- Rutten J, Vlieger AM, Frankenhuis C, George EK, Groeneweg M, Norbruis OF, et al. Home-based hypnotherapy self-exercises vs individual hypnotherapy with a therapist for treatment of pediatric irritable bowel syndrome, functional abdominal pain, or functional abdominal pain syndrome: a randomized clinical trial. *JAMA Pediatr.* 2017;171(5):470-7.
- Vlieger AM, Menko-Frankenhuis C, Wolfkamp SC, Tromp E, Benninga MA. Hypnotherapy for children with functional abdominal pain or irritable bowel syndrome: a randomized controlled trial. *Gastroenterol.* 2007;133(5):1430-6.
- Anbar RD, Zoughbi GG. Relationship of headache-associated stressors and hypnosis therapy outcome in children: a retrospective chart review. *Am J Clin Hypnosis.* 2008;50(4):335-41.
- Jong MC, Boers I, van Wietmarschen HA, Tromp E, Busari JO, Wennekes R, et al. Hypnotherapy or transcendental meditation versus progressive muscle relaxation exercises in the treatment of children with primary headaches: a multi-centre, pragmatic, randomised clinical study. *Eur J Pediatr.* 2019;178(2): 147-54.
- Kohen DP, Zajac R. Self-hypnosis training for headaches in children and adolescents. *J Pediatr.* 2007;150(6):635-9.
- Kohen DP. Long-term follow-up of self-hypnosis training for recurrent headaches: what the children say. *Int J Clin Experiment Hypnosis.* 2010;58(4):417-32.
- Birnie KA, Noel M, Chambers CT, Uman LS, Parker JA. Psychological interventions for needle-related procedural pain and distress in children and adolescents. *Cochrane Database Syst Rev.* 2018; 10(10):CD005179.

22. Nunns M, Mayhew D, Ford T, Rogers M, Curle C, Logan S et al. Effectiveness of nonpharmacological interventions to reduce procedural anxiety in children and adolescents undergoing treatment for cancer: A systematic review and meta-analysis. *Psycho-oncol.* 2018;27(8):1889-99.
23. Tomé-Pires C, Miró J. Hypnosis for the management of chronic and cancer procedure-related pain in children. *Int J Clin Experiment Hypnosis.* 2012; 60(4):432-57.
24. Wilson-Smith EM. Procedural pain management in neonates, infants and children. *Rev Pain.* 2011;5(3):4-12.
25. Anbar RD. Self-hypnosis for management of chronic dyspnea in pediatric patients. *Pediatr.* 2001;107(2): E21.
26. Anbar RD. Hypnosis in pediatrics: applications at a pediatric pulmonary center. *BMC Pediatr.* 2002;2:11.
27. Anbar RD, Sachdeva S. Treatment of psychological factors in a child with difficult asthma: a case report. *Am J Clin Hypnosis.* 2011;54(1):47-55.
28. McBride JJ, Vlieger AM, Anbar RD. Hypnosis in paediatric respiratory medicine. *Paediatr Resp Rev.* 2014;15(1):82-5.
29. Pretorius E. The role of alternative and complementary treatments of asthma. *Acupunct Electro-therapeutics Res.* 2009;34(1-2):15-26.
30. Keefer L, Taft TH, Kiebles JL, Martinovich Z, Barrett TA, Palsson OS. Gut-directed hypnotherapy significantly augments clinical remission in quiescent ulcerative colitis. *Aliment Pharmacol Therap.* 2013; 38(7):761-71.

**Cite this article as:** Bastek VB, Groeneveld EM, van Vliet MJ. Medical hypnotherapy; even in a tertiary care setting a promising treatment. *Int J Contemp Pediatr* 2022;9:418-24.