USE OF INTERFERENTIAL CURRENT IN CONSTIPATED WOMEN

USO DA CORRENTE INTERFERENCIAL EM MULHERES CONSTIPADAS

USO DE CORRIENTE INTERFERENCIAL EN MUJERES CON ESTREÑIMIENTO

https://doi.org/10.56238/sevened2026.019-079

Cibbele da Silva Mendonça[1], Silvana Maria de Macedo Uchôa[2]

ABSTRACT

Introduction: Constipation is a common problem in the general population around the world, Pelvic physiotherapy is of great importance in the treatment of pelvic floor dysfunctions and in the case of intestinal constipation, it is believed that the addition of electrical stimulation using interferential current in the treatment may improve colonic transit, facilitating the elimination of feces.

Objective: To analyze the effectiveness of interferential current for the treatment of constipation in women.

Methods: Study quasi-experimental, descriptive and cross-sectional study. The following questionnaires were used: sociodemographic; Constipational Scoring System; Bristol Stool Scale and Perceived Change Scale (PME).

Results: The sample is made up of women aged between 18 and 27 years and single. With 16,7% showed a change in score on the Bristol scale, changing from Type 2 - (Constipation) for Type 4- (Healthy Stools). Regarding the Constipation Scoring System scale, it was observed that the patients did not show relevant statistical improvement. A small reduction was seen on the constipation scale of 10 ∓ 3. an improvement was observed in aspects such as mood, ability to withstand difficult situations, sleep, leisure activities and self-esteem in 83.35% of patients, an aspect that directly impacts quality of life.

Final Considerations: In view of the above, it is observed that there was a small improvement in the ROME IV criteria, the Bristol stool scale and the Perceived Change Scale, however, the use of interferential current appears to be effective for the treatment of intestinal constipation. However, due to the small sample number, it was not possible to find statistical variables.

Keyword: Interferential Current. Intestinal Constipation. Women.

[1] Family Health Resident. Instituto de Medicina Integral Professor Fernando Figueira (IMIP).
E-mail: cibbelemendonca19@gmail.com Orcid: 0009-0004-2106-3809
Lattes: http://lattes.cnpq.br/9990321231435650
[2] Dr. in Clinical Psychology. Universidade Católica de Pernambuco. E-mail: silvanammu@gmail.com
Orcid: 0000-0002-4635-9428 Lattes: http://lattes.cnpq.br/0088396226405872

RESUMO

Introdução: A constipação intestinal constitui um problema frequente na população geral de todo o mundo, a fisioterapia pélvica tem grande importância no tratamento das disfunções do assoalho pélvico e no caso da constipação intestinal, acredita-se que a adição da estimulação elétrica utilizando a corrente interferencial no tratamento poderá melhorar o trânsito colônico, facilitando a eliminação das fezes.

Objetivo: Analisar a eficácia da corrente interferencial para o tratamento da constipação em mulheres.

Métodos: Estudo quase experimental, descritivo e de corte transversal. Foram utilizados os questionários: sociodemográfico; Constipacional Scoring System; Escala de fezes de Bristol e Escala de Mudança percebida (EMP).

Resultados: A amostra é composta por mulheres tendo entre 18 e 27 anos e solteiras. Tendo 16,7% apresentado mudança de pontuação na escala de Bristol se modificando de Tipo 2- (Constipação) para Tipo 4- (Fezes saudáveis). Com relação a escala Constipation Scoring System observou-se que as pacientes não apresentaram melhora estatística relevante. Sendo vista pequena redução na escala de constipação de 10∓3. foi observado melhora em aspectos como humor, capacidade de suportar situações difíceis, sono, atividades de lazer e autoestima em 83,35% das pacientes, aspecto que impacta diretamente na qualidade de vida.

Considerações Finais: Diante do exposto, observa-se que houve pequena melhora nos critérios de ROMA IV, na escala de fezes de Bristol e na Escala de Mudança Percebida, portanto, o uso da corrente interferencial parece ser eficaz para o tratamento da constipação intestinal. Porém, devido ao pequeno número amostral não foi possível encontrar variáveis estatísticas.

Palavras-chave: Corrente Interferencial. Constipação Intestinal. Mulheres.

RESUMEN

Introducción: El estreñimiento es un problema común en la población general en todo el mundo. La fisioterapia pélvica es de gran importancia en el tratamiento de las disfunciones del suelo pélvico y, en el caso del estreñimiento intestinal, se cree que la adición de estimulación eléctrica mediante corriente interferencial en el tratamiento puede mejorar el tránsito colónico, facilitando la eliminación de las heces.

Objetivo: Analizar la efectividad de la corriente interferencial para el tratamiento del estreñimiento en mujeres.

Métodos: Estudio cuasiexperimental, descriptivo y transversal. Se utilizaron los siguientes cuestionarios: sociodemográfico; Sistema de Puntuación de Estreñimiento; Escala de Heces de Bristol y Escala de Cambio Percibido (PME).

Resultados: La muestra está compuesta por mujeres de entre 18 y 27 años y solteras. Con un 16,7% mostró un cambio en la puntuación en la escala de Bristol, pasando del Tipo 2 (Estreñimiento) al Tipo 4 (Heces Saludables). Con respecto a la escala del Sistema de Puntuación de Estreñimiento, se observó que las pacientes no mostraron una mejora estadísticamente relevante. Se observó una pequeña reducción en la escala de estreñimiento de 10∓3. Se observó una mejoría en aspectos como el estado de ánimo, la capacidad para

afrontar situaciones difíciles, el sueño, las actividades de ocio y la autoestima en el 83,35% de los pacientes, un aspecto que impacta directamente en la calidad de vida.

Consideraciones finales: En vista de lo anterior, se observa que hubo una pequeña mejoría en los criterios ROME IV, la escala de heces de Bristol y la Escala de Cambio Percibido; sin embargo, el uso de corriente interferencial parece ser eficaz para el tratamiento del estreñimiento intestinal. No obstante, debido al pequeño tamaño de la muestra, no fue posible encontrar variables estadísticas.

Palabras clave: Corrente Interferencial. Estreñimiento Intestinal. Mujeres.

1 INTRODUCTION

Intestinal constipation is a frequent problem in the general population around the world, affecting both sexes and all age groups, being more frequent in women (Bharucha; Lacy, 2020). It is a symptomatology and not a specific pathology; however, it may indicate some manifestation of disease that requires investigation for its diagnosis and is characterized by difficulty in eliminating feces (Ortega *et al*, 2022).

It can generate discomfort and other disorders related to the patient's social, economic and psychological life (Bharucha, 2007). In most cases, constipation does not have its cause related to an anatomical disorder of the intestinal tract, the most common cause being the difficult passage of the fecal bolus on its way towards the anal canal. In this case, it is called primary constipation, caused by a food intake low in vegetable fiber and insufficient fluid intake (Silva *et al*, 2020).

Other factors may be associated with primary constipation, such as a sedentary lifestyle, psychological aspects such as anxiety, depression, the habit of postponing going to the bathroom, common in some work areas, and the side effects of some medications, contributing to alteration or worsening of intestinal functioning (Dias *et al*, 2023).

According to the pathophysiology, constipation can be divided into 3 categories: 1. Normal transit constipation, also called functional, is the most common form of presentation. Although the time for stool to pass through the colon is normal, the patient reports constipation, complaining of hardened stools or dissatisfaction with bowel movements. 2. Slow transit constipation that occurs due to alteration in the propulsion of feces through peristalsis 3. dysfunction of the evacuatory act or dyssynergic evacuation, which is an abdominopelvic incoordination, most commonly occurring in women who have infrequent evacuation, which can be up to once a week, commonly starting at puberty and having a wide variety of treatments including physiotherapy Sadler *et al*, 2022) (Pannemans *et al*, 2020).

Pelvic physiotherapy is of great importance in the treatment of pelvic floor dysfunctions and in the case of intestinal constipation, its therapeutic objective is to restore the function of the pelvic floor and abdominal muscles, stimulate the proprioception of the muscles, providing a contraction and relaxation in a coordinated and functional way, thus enabling a better function and quality of life for patients (Firmino, 2015). In this sense, this area of physical therapy, in relation to the approach to patients with intestinal constipation, still lacks studies, especially regarding the use of electrotherapy within the therapeutic conduct (Heemskerk *et al*, 2024) *(*Norton *et al*, 2023).

Interferential current (IC) is a transcutaneous nerve stimulation of medium-frequency alternating electrical currents with their amplitude modulated at low frequency for therapeutic purposes (Rampazo *et al*, 2023). In this context, it is believed that the addition of electrical stimulation using interferential current in the treatment may improve colonic transit, facilitating the elimination of feces through stimulation of the vagal sympathetic and parasympathetic nerves of the intestine. This therapy can bring beneficial effects in the sense of reestablishing good abdominopelvic coordination and thus positively interfering with the main characteristics of dyssynergic-type constipation (Samhan, 2020). In view of the above, the present study aimed to verify the efficacy of the use of interferential current in constipated women.

2 MATERIALS AND METHOD

The present study is linked to the Catholic University of Pernambuco (UNICAP), the School of Health and Life Sciences and the Physical Therapy course at UNICAP. It is an integral part of the research project entitled "Physiotherapeutic approaches in Anorectal Dysfunctions in Adults and the Elderly" under the coordination of SILVANA MARIA MACEDO UCHÔA, approved by the ethics and research committee in human beings, with the opinion number 3.049.749 and CAAE: 03239318.1.000.5206 and belonging to the Evidence-based Physiotherapy group being developed at the Corpore Sano Physiotherapy and Occupational Therapy Laboratory.

This is a quasi-experimental, descriptive and cross-sectional study, being carried out through questionnaires applied to volunteers with intestinal constipation. The sample consisted of 6 individuals. The data collection period took place from September 2023 to June 2024.

The inclusion criteria will be considered: adults in the age group of 18 to 40 years; have good cognitive function and are constipated according to the Rome IV criteria and the following exclusion criteria: Pregnant women; individuals who had gastrointestinal tract neoplasia; individuals with psychiatric disorders and individuals who are using laxative medication.

After reading and signing the Informed Consent Form (ICF), which contains clear and detailed information and the objectives of the research, the volunteers answered the following instruments: Sociodemographic questionnaire, containing questions about name, color, race, marital status, education, etc. The clinical diagnosis of constipation was based on the ROMA IV criteria for functional bowel disorders, which include the following items: fewer than three weekly bowel movements, evacuatory effort, sensation of incomplete evacuation, presence of hardened or fragmented stools, and need for manual maneuvers to facilitate bowel movements. Individuals who present at least two or more of these manifestations in at least 25% of bowel

movements in the last three months, starting at least six months before, were considered constipated (Drossman, 2016).

In addition, the Agachan questionnaire was used, consisting of questions related to bowel frequency, evacuatory effort, sensation of incomplete evacuation, abdominal pain, time to evacuate, evacuatory aid, attempts to evacuate within 24 hours, and how long it has been with constipation (Froehner *et al*, 2023) . The Bristol Stool Scale was also used, which aims to identify the type of stool, and is composed of seven types: type I (small hard fragments), type II (sausage-shaped, but with lumps), type III (sausage-shaped, but with cracks on the surface), type IV (sausage-shaped, but soft and soft), type V (soft pieces, but sharp contours), type VI (pasty pieces with an ill-defined shape) and type VII (liquid, without pieces) (Martinez, 2012). Ending with a questionnaire of perceived change where it was evaluated in relation to different aspects of the patient's life such as: physical health, mood, ability to fulfill obligations, among others, being distributed into: worse than before, no change and better than before (Flag *et al*, 2011).

An IBRAMED electrostimulator with 4 channels was used, with the electrodes being placed in the regions, two abdominal (placed below the costal margin) and two paravertebral (placed between T9 and L2), producing two sinusoidal currents crossing the body and being previously greased with aqueous gel. The parameters used were as follows: 4 kHz, a beat frequency of 80-160 Hz and an intensity of at least 33 mA for 20 minutes (Chase *et al*, 2005). 10 treatment sessions were performed, once a week. Guidance was also given about the food component and its importance, and then the previously mentioned questionnaires were reapplied.

3 RESULTS

The present study would initially consist of 10 university students, however, over period 4 they gave up due to unavailability of time to continue the treatment, the study was composed of 6 university students aged between 18 and 27 years who were evaluated for the presence of constipation and appearance of feces, using the interferential current over 10 sessions, once a week. Regarding sociodemographic characteristics, it was observed that 50% (n=3) of the university students were aged between 23 and 27 years, 100% (n=6) were single and 100% (n=6) studied at a Higher Education Institution (HEI).

Table 1

Distribution of women according to sociodemographic characteristics

Sociodemographic characteristics	N	%
Age group		
18 to 22	3	50
23 to 27	3	50
Social class		
A (+15 SM)	0	0
B (5 to 15 MW)	2	33,3
C (3 to 5 MW)	2	33,3
D (1 to 3 MW)	1	16,7
E (up to 1 MW)	1	16,7
Marital status		
Single	100	6
Married	0	0

Source: Prepared by the authors.

Regarding the distribution of the university students regarding the questionnaire of constipation symptoms based on the criteria of Rome IV, the prevalence of two symptoms stands out: Defecatory effort in more than 25% of bowel movements 66.7% (n=4) and granulated or lumpy feces 66.7% (n=2). In addition, 50% (n=3) reported a decrease in the criteria for Rome IV.

It is noteworthy that, regarding the Bristol stool scale, it was found that the participants presented: Type 1 - Separate pieces hard like peanuts of 33.3% (n=2), Type 2 - Sausage shape but segmented 33.3% (n=2) and Type 3 - Sausage shapes with cracks on the surface: 33.3% (n=2). After reassessment, it was observed that 16.6% (n=1) had their scale modified, changing from Type 2 - constipational feces to Type 4 healthy feces.

Table 2

Distribution of women according to the Bristol scale

Bristol Scale	N before/after	% after
1 - Separate pieces hard as peanuts	2-1	16,7%
2- Sausage shape but segmented	2-2	33,3%
3- Sausage shapes with slits on the surface	2-2	-
4- Forms of sausage or snake smooth or soft	0-1	33,3%
5- Soft bits, but sharp outlines	-	-
6- Aerated bits, frayed contours	-	-
7- Aqueous without solid parts	-	-

Source: Prepared by the authors.

Regarding the *Constipation Scoring System*, after treatment, an increase in bowel frequency was reported by 83.3% (n=5) of the volunteers, a decrease in the frequency of

abdominal pain reported by 66.7% (n=4) and a decrease in the number of reports of situations with failures or failures to evacuate in the last 24 hours by 50%, as shown in Table 3.

Table 3

Distribution of women according to the Constipation Scoring System

Constipation Scoring System	N	% after
Frequency of bowel movements		
1-2 times every 1-2 days	2-4	66,7%
2 times a week	2-1	0
1 time a week	1-	-
Less than 1 time a week	1-1	16,7%
Less than 1 time a month	-	-
Pain or discomfort when defecating		
Never	0-1	-
Rarely	2-2	33,3%
Sometimes	3-2	33,3%
Usually	1-1	-
Always	-	-
Incomplete evacuation		
Never	0-1	-
Rarely	1-1	-
Sometimes	2-2	33,3%
Usually	2-0	-
Always	1-2	33,3%
Abdominal pain		
Never	0-1	-
Rarely	0-3	50%
Sometimes	6-1	16,7%
Usually	0-1	-
Always	-	-
Time in minutes in the bathroom		
Less than 5 minutes	1-2	33,3%
5 to 10 minutes	2-2	33,3%
10 to 20 minutes	2-2	33,3%
20 to 30 minutes	-	-
More than 30 minutes	1-0	-
Digital maneuvers and type of assistance		
No assistance	6-6	100%
Laxatives	-	-
Digital assistance or enema	-	-
Failed or unsuccessful attempts to evacuate within the past 24 hours		
Never	2-3	50%
1-3	4-2	33,3%
3-6	0-1	16,7%
6-9	-	-
9+	-	-
Duration of constipation in years		
Zero	-	-
1-5	1	16,7%
5-10	1	16,7%
10-20	2	33,3%
20+	2	33,3%
Total average after	10∓3 am	

Source: Prepared by the authors.

In addition, on the Perceived Change Scale (EMP), 83.3% (n=5) of the volunteers reported improvement in mood, ability to endure difficult situations, personal problems, stability of emotions, self-confidence, appetite, sleep and leisure activities, in addition to variables such as ability to fulfill obligations, homework, interest in working, sexuality, energy and interest in life were reported as unchanged, and were shown in Table 4.

Table 4

Distribution of the university students according to the Perceived Change Scale (EMP)

Perceived Change Scale (EMP)			
Do you think the treatment helped you feel better? If yes how? If not, why?	Yes, along with the treatment I started to re-educate myself in eating and I noticed a lot of improvement and easier to evacuate I went to the bathroom more often, consequently making me less bloated and with an improvement in mood Yes, I have been going to the bathroom more often Yes, in the first session at the end of the day I already felt like evacuating The treatment helped me with frequency and ease I'm going to the bathroom more often with shorter breaks		
For each item below since you started treatment is ?	Worse than before	No change	Better than before
Your personal problems	-	33.3% (n=2)	66.7% (n=4)
Your mood	-	16,7% (n=1)	83.3% (n=5)
The stability of your emotions	-	33.3% (n=2)	66.7% (n=4)
Your confidence in yourself	-	33.3% (n=2)	66.7% (n=4)
His interest in life	-	66.7% (n=4)	33.3% (n=2)
Your ability to endure difficult situations	-	50% (n=3)	50% (n=3)
Your appetite	-	33.3% (n=2)	66.7% (n=4)
Your energy	-	33.3% (n=2)	66.7% (n=4)
Your sleep	-	33.3% (n=2)	66.7% (n=4)
Your physical health	16.7% (n=1)	16.7% (n=1)	66.7% (n=4)
Your sexuality	-	100% (n=6)	-
Your coexistence with family and friends	16.7% (n=1)	16.7% (n=1)	66.7% (n=4)
Your coexistence with your friends	-	66.7% (n=4)	33.3% (n=2)
Your coexistence with other people	-	66.7% (n=4)	33.3% (n=2)

Your interest in working	-	50% (n=3)	50% (n=3)
Your leisure activities	-	16.7% (n=1)	83.3% (n=5)
Your homework assignments	-	83.3% (n=5)	16,7% (n=1)
Your ability to meet obligations		50% (n=3)	50% (n=3)
Finally, since you started treatment in general you are?	-	-	100% (n=6)

Source: Prepared by the authors.

Regarding the reapplication of the questionnaires, it was noted that after the treatment there was a small decrease in the *Constipation Scoring System* score of 10∓3, in addition to a decrease in the number of Roma IV criteria marked by 33.3% (n=2) and no significant change in the Bristol scale. Due to the low sample size, it was not possible to find statistical relationships between the variables.

4 DISCUSSION

Regarding sociodemographic data, the present study showed that 50% of the participants were in the age group between 23 and 27 years. Not corroborating with Chase *et al* (2005) who in turn used the interferential current to treat resistant chronic constipation with children aged 7 to 16 years as a sample and with Samhan *et al* (2020) where ages ranged from 7 to 15 years, however, it was similar to the study by Moore *et al* (2020) and Queralto *et al* (2013) where both carried out their studies with individuals over 18 years of age.

Regarding the gender of the sample, Vitton *et al* (2023) obtained about 94.8% of the participants being female, which was assimilated by Moore et al (2020), who carried out a randomized clinical trial using the interferential current in a 100% female sample composed of 17 women, which is in line with this study.

As observed in the study by Samhan et al (2020), which used the interferential current in the treatment of children with dyssynergic-type constipation, the initial evaluation did not show significant short-term differences in relation to the frequency of fecal incontinence per week and the type of stool assessed by the Bristol scale, which corroborated the present study so that this scale did not present a statistically significant difference, with 16.7% (n=1) having a score of 2 (constipational feces) before and type 4 (healthy feces) after treatment, which indicates an improvement.

In view of the study by Queralto *et al* (2020) it was shown that after applying the interferential current at home for one hour a day for 3 months, patients improved significantly in all scores. Prior to stimulation, most had an average number of stools per week of 0.33 or 0.66, and the highest post-stimulation frequency was 1.66 stools per week, indicating improvement in the criteria for ROMA IV. Similar to the study by Yang *et al* (2017), that after the intervention the average number of bowel movements per week improved from 3.7 to 5.6 in the treatment arm, but not in the placebo group that did not use the interferential current. Corroborating this study where 33.3% reported improvement in the frequency of bowel movements per week, decreased excessive voluntary fecal retention, and painful defecation.

Regarding electrotherapy, Yin *et al*(2023) showed that high-frequency stimulation being administered transabdominally from two different angles at the point converge, so that the stimulation currents interfere with each other, generating stimulation at a differential frequency, thus allowing the stimulation current to penetrate through the abdominal wall to reach the target organ and producing therapeutic effects. Thus, as suggested by Chen *et al* (2023), electrical stimulation during interferential current can activate the vagal sympathetic and parasympathetic nerves of the bowel, but is unlikely to directly stimulate the pelvic floor and external anal sphincter. However, there is still a lack of scientific articles on the efficacy of interferential current, especially double-blind randomized clinical trials with a large sample size, as reported by Moore *et al* (2018).

The findings of the present study corroborate what was found in Chase *et al* (2005) and the study carried out with eight children, which demonstrated that the frequency of defecations increased by 62.5% after treatment with interferential current, also similar to the studies of Clark *et al* (2009) who used interferential current for the treatment of slow transit intestinal constipation where after the use of interferential current in the group Control (n=22) colonic transit was significantly faster than those who received placebo (n=8), however, both studies disagree with the double-blind randomized multicenter trial by Vitton *et al* (2023) which stated that they did not observe significant changes in constipation, but rather in terms of quality of life.

According to Vitton *et al* (2023), quality of life is the most reflective perceived improvement in constipation symptoms and in this study with 160 individuals it was noted that satisfaction in the control group reached the average score on the PAC-QOL (Patient Assessment of Constipation Quality of Life) of 2.75 against 2.50 in the group that received placebo. In the present study, the perception of improvement aspect was assessed by the Perceived Change Scale (EMP), cross-culturally validated by Gentil (2023) so that it was

reported by 83.3% (n=5) of the patients that there was an improvement in mood, in the ability to withstand difficult decisions and improvement resulting from the treatment in general.

In addition to the fact that 83.3% (n=5) reported improvement after treatment in aspects such as personal problems, stability of emotions, appetite, sleep, and leisure activities, this situation was also observed in the study by Zhu *et al* (2018)[26] where, after treatment with electrotherapy in cancer patients with intestinal constipation, a significant improvement in quality of life equal to 29.83±6,64 was observed. As well as, in Gokce (2020) who used electrotherapy for 30 minutes 3 times a week over 6 weeks, where a report of subjective improvement was reported in 50% (n=18) of the patients, which agreed with the present study.

Regarding the biopsychosocial model, Lee *et al* (2017) stated that psychosocial factors such as psychological state, characteristics of the individual and stress in life also affect intestinal physiology, compromising the secretory function and mucosal barrier through the alteration of the efferent autonomic nervous system and the stress hormonal system. Therefore, as reported by Gentil *et al* (2023) and Scott *et al* (2021), psychological aspects are of great importance in the treatment of constipation, as well as changes in diet, physical activity, and use of medications, which requires multiprofessional and individualized action.

5 FINAL CONSIDERATIONS

In view of the above, it was possible to observe that the sample is composed of young women, aged between 18 and 27 years, single, and of economic class from B to E. Regarding the criteria for ROMA IV, it was reported that 33.3% of the volunteers had a decrease in the criteria regarding the symptoms of frequency of small bowel movements per week, excessive voluntary fecal retention, and painful defecation. 16.7% had a change in score on the Bristol scale, changing from Type 2- (Constipation) to Type 4- (Healthy stools).

Regarding the Constipation Scoring System scale, it was observed that the patients did not show statistically relevant improvement. A small reduction in the constipation scale of 10 ∓ 3 was observed. However, improvement in psychological aspects such as mood, ability to withstand difficult situations, sleep, and self-esteem was observed in 83.35% of the patients, an aspect that directly impacts quality of life and is intrinsically related to comorbidity due to the brain-gut model.

The small sample size made it impossible to make any statistical correlations between the groups evaluated, requiring greater scientific production on the subject, which lacks specific studies focusing on the standardization of the application of the method, with a large sample size, in addition to awareness about the lifestyle with continuous and multidisciplinary treatment.

REFERENCES

1. Bandeira, M. de B., Andrade, M. C. R., Costa, C. S., & Silva, M. A. da. (2011). Percepção dos pacientes sobre o tratamento em serviços de saúde mental: Validação da Escala de Mudança Percebida. Psicologia: Reflexão e Crítica, 24(2), 236–244. https://doi.org/10.1590/S0102-79722011000200004

2. Bharucha, A. E. (2007). Constipation. Best Practice & Research Clinical Gastroenterology, 21(4), 709–731. https://doi.org/10.1016/j.bpg.2007.07.001

3. Bharucha, A. E., & Lacy, B. E. (2020). Mechanisms, evaluation, and management of chronic constipation. Gastroenterology, 158(5), 1232–1249.e3. https://doi.org/10.1053/j.gastro.2019.12.034

4. Chase, J., Robertson, V. J., Southwell, B., Hutson, J., & Gibb, S. (2005). Pilot study using transcutaneous electrical stimulation (interferential current) to treat chronic treatment-resistant constipation and soiling in children. Journal of Gastroenterology and Hepatology, 20(7), 1054–1061. https://doi.org/10.1111/j.1440-1746.2005.03863.x

5. Clarke, M. C., Chase, J. W., Gibb, S., Robertson, V. J., Catto-Smith, A., Hutson, J. M., & Southwell, B. R. (2009). Decreased colonic transit time after transcutaneous interferential electrical stimulation in children with slow transit constipation. Journal of Pediatric Surgery, 44(2), 408–412. https://doi.org/10.1016/j.jpedsurg.2008.10.100

6. Dias, F. C., Boilesen, S. N., Tahan, S., Melli, L., & Morais, M. B. (2023). Overweight status, abdominal circumference, physical activity, and functional constipation in children. Revista da Associação Médica Brasileira, 69(3), 386–391. https://doi.org/10.1590/1806-9282.20220845

7. Drossman, D. A. (2016). Functional gastrointestinal disorders: History, pathophysiology, clinical features and Rome IV. Gastroenterology, 150(6), 1262–1279.e2. https://doi.org/10.1053/j.gastro.2016.02.032

8. Dz Chen, J., Zhu, Y., & Wang, Y. (2023). Emerging noninvasive neuromodulation methods for functional gastrointestinal diseases. Journal of Translational Internal Medicine, 10(4), 281–285. https://doi.org/10.2478/jtim-2022-0060

9. Firmino, R. C., & Carvalho, V. C. (2015). Conscientização do assoalho pélvico em acadêmicas de fisioterapia com constipação intestinal de uma unidade de ensino superior em Recife-PE. Revista Inspirar Movimento e Saúde, 7(1), 18–22.

10. Froehner Junior, I., Jorge, J. M. N., Marques, C. F. S., Santos, V. L. C. de G., & Jukemura, J. (2023). Constipation Scoring System validated for the Portuguese language (Índice de Gravidade da Constipação Intestinal): Is it reliable in assessing the severity of intestinal chronic constipation in our population? ABCD. Arquivos Brasileiros de Cirurgia Digestiva, 36, e1785. https://doi.org/10.1590/0102-672020230067e1785

11. Gentil, M. E. N., Oliveira, L. de L., & Silva, M. C. da. (2023). Therapies used in the treatment of primary intestinal constipation. Research, Society and Development, 12(13), e43121344220.

12. Gokce, A. H., & Gokce, F. S. (2020). Effects of bilateral transcutaneous tibial nerve stimulation on constipation severity in geriatric patients: A prospective clinical study. Geriatrics & Gerontology International, 20(2), 101–105. https://doi.org/10.1111/ggi.13822

13. Heemskerk, S. C. M., et al. (2024). Effectiveness, safety and cost-effectiveness of sacral neuromodulation for idiopathic slow-transit constipation: A systematic review. Colorectal Disease, 26(3), 417–427. https://doi.org/10.1111/codi.16876

14. Lee, C., et al. (2017). The increased level of depression and anxiety in irritable bowel syndrome patients compared with healthy controls: Systematic review and meta-analysis. Journal of Neurogastroenterology and Motility, 23(3), 349–362. https://doi.org/10.5056/jnm16220

15. Martinez, A. P., & Azevedo, G. R. de. (2012). The Bristol Stool Form Scale: Its translation to Portuguese, cultural adaptation and validation. Revista Latino-Americana de Enfermagem, 20(3), 583–589. https://doi.org/10.1590/S0104-11692012000300021

16. Moore, J. S., Gibson, P. R., & Burgell, R. E. (2018). Neuromodulation via interferential electrical stimulation as a novel therapy in gastrointestinal motility disorders. Journal of Neurogastroenterology and Motility, 24(1), 19–29. https://doi.org/10.5056/jnm17071

17. Moore, J. S., Gibson, P. R., & Burgell, R. E. (2020). Randomised clinical trial: Transabdominal interferential electrical stimulation vs sham stimulation in women with functional constipation. Alimentopharmacology & Therapeutics, 51(8), 760–769. https://doi.org/10.1111/apt.15642

18. Ortega, M. V., et al. (2022). Women with chronic constipation have more bothersome urogenital symptoms. Techniques in Coloproctology, 26(1), 29–34. https://doi.org/10.1007/s10151-021-02518-4

19. Pannemans, J., Masuy, I., & Tack, J. (2020). Functional constipation: Individualising assessment and treatment. Drugs, 80(10), 947–963. https://doi.org/10.1007/s40265-020-01305-z

20. Queralto, M., Vitton, V., Bouvier, M., Abysique, A., & Portier, G. (2013). Interferential therapy: A new treatment for slow transit constipation. A pilot study in adults. Colorectal Disease, 15(1), e35–e39. https://doi.org/10.1111/codi.12052

21. Rampazo, É. P., et al. (2023). Effectiveness of interferential current in patients with chronic non-specific low back pain: A systematic review with meta-analysis. Brazilian Journal of Physical Therapy, 27(5), 100549. https://doi.org/10.1016/j.bjpt.2023.100549

22. Sadler, K., Arnold, F., & Dean, S. (2022). Chronic constipation in adults. American Family Physician, 106(3), 299–306.

23. Samhan, A. F., Abdelbasset, W. K., & Elnaggar, R. K. (2020). Clinical evaluation of the effectiveness of interferential current therapy in the treatment of children with pelvic floor dyssynergia-type constipation: A randomized controlled study. The Turkish Journal of Pediatrics, 62(6), 1002–1011. https://doi.org/10.24953/turkjped.2020.06.012

24. Scott, S. M., et al. (2021). Chronic constipation in adults: Contemporary perspectives and clinical challenges. 1: Epidemiology, diagnosis, clinical associations, pathophysiology and investigation. Neurogastroenterology & Motility, 33(6), e14050. https://doi.org/10.1111/nmo.14050

25. Silva, A. K. L. C. P. da, Pereira, P. M. de L., Seixas, T. B., & Percegoni, N. (2020). Constipação intestinal e fatores associados em pacientes internados em um hospital universitário. Revista da Associação Brasileira de Nutrição (RASBRAN), 11(1), 72–85. https://doi.org/10.47320/rasbran.2020.1753

26. Vitton, V., et al. (2023). Interferential therapy for chronic constipation in adults: The CON-COUR randomized controlled trial. United European Gastroenterology Journal, 11(4), 337–349. https://doi.org/10.1002/ueg2.12373

27. Yang, Y., Yim, J., Choi, W., & Lee, S. (2017). Improving slow-transit constipation with transcutaneous electrical stimulation in women: A randomized, comparative study. Women & Health, 57(4), 494–507. https://doi.org/10.1080/03630242.2016.1176098

28. Yin, J., & Chen, J. D. (2023). Noninvasive electrical neuromodulation for gastrointestinal motility disorders. Expert Review of Gastroenterology & Hepatology, 17(12), 1221–1232. https://doi.org/10.1080/17474124.2023.2288156

29. Zhu, H. D., et al. (2018). The efficacy and safety of transcutaneous acupoint interferential current stimulation for cancer pain patients with opioid-induced constipation: A prospective randomized controlled study. Integrative Cancer Therapies, 17(2), 437–443. https://doi.org/10.1177/1534735417734910