

## Abstract

**Background:** Fecal incontinence (FI) is a distressing condition with limited treatment options, leading to significant impairment in quality of life. Percutaneous Tibial Nerve Stimulation (PTNS) has emerged as a potential therapy, yet its efficacy remains uncertain.

**Aim:** This systematic review evaluates evidence of PTNS efficacy in FI management.

**Methods:** A systematic review was conducted to determine the efficacy of PTNS in treating FI. Studies were searched for in PubMed, EMBASE, the Web of Science, and the Cochrane Library.

**Conclusion:** PTNS appears to be a promising therapy option for FI, with evidence suggesting that symptoms and quality of life can improve. However, more well-designed trials with bigger sample sizes and longer follow-up periods are required to validate these findings and determine the best use of PTNS in treating FI.

## Introduction

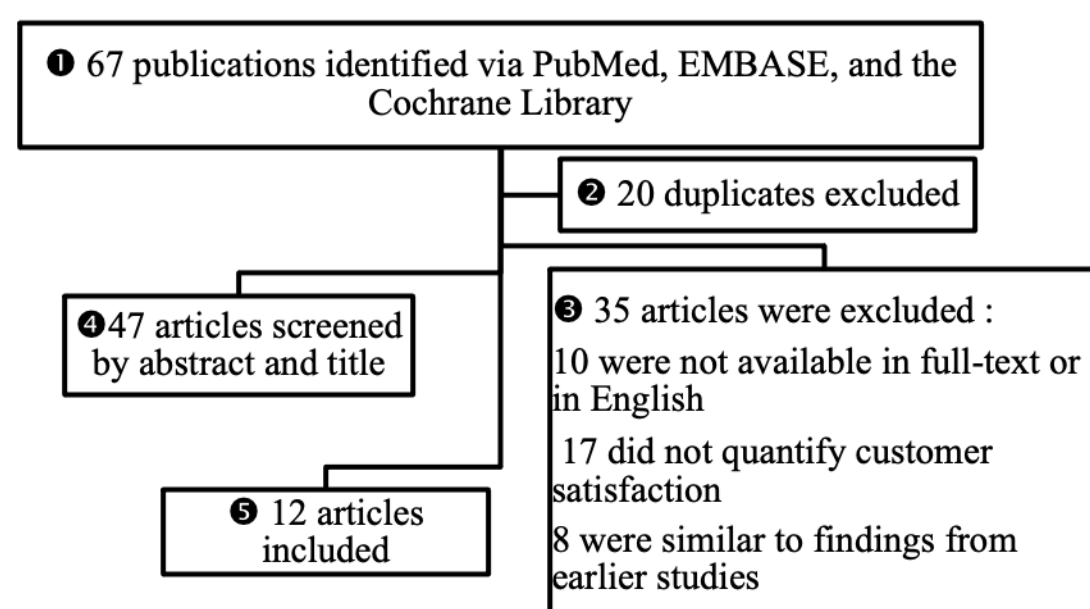
Involuntary fecal material leakage, known as FI, is a debilitating condition that significantly reduces the quality of life for individuals experiencing it. The potential consequences include loss of independence, diminished self-confidence, and social discrimination. Despite the prevalence and serious impact of the condition, there are few effective treatment options available, leaving numerous patients without satisfactory relief.

A novel approach to treating FI is through nerve stimulation therapy, specifically PTNS. PTNS is believed to alter the neural pathways responsible for bowel control by stimulating the tibial nerve near the ankle. This minimally invasive procedure has generated considerable interest as it presents a possible non-surgical solution for patients unresponsive to conservative treatments or those at risk for surgery-related complications.

This analysis will evaluate PTNS's efficacy by studying methodology, outcomes, demographics, and study design. Understanding PTNS efficacy can enhance clinical practices and treatment strategies for faecal incontinence patients. This review aims to contribute to the current knowledge by analyzing data critically, potentially leading to improved treatments for this challenging condition.

## Methods and Materials

To conduct the systematic review a number of databases (PubMed, EMBASE) and web of science and the Cochrane Library used to gather past studies in this field. These articles have appeared in peer-reviewed journals. The following keywords were entered into the search engine: "PTNS Bowel Control Treatment Outcomes Clinical Trials Randomized controlled trials (RCTs) Meta-analysis Long-term Follow-up Therapeutic Efficacy Patient-reported outcomes Adverse effects Neurostimulation therapy Quality life fecal incontinence Neuromodulation Tibial nerve stimulation"



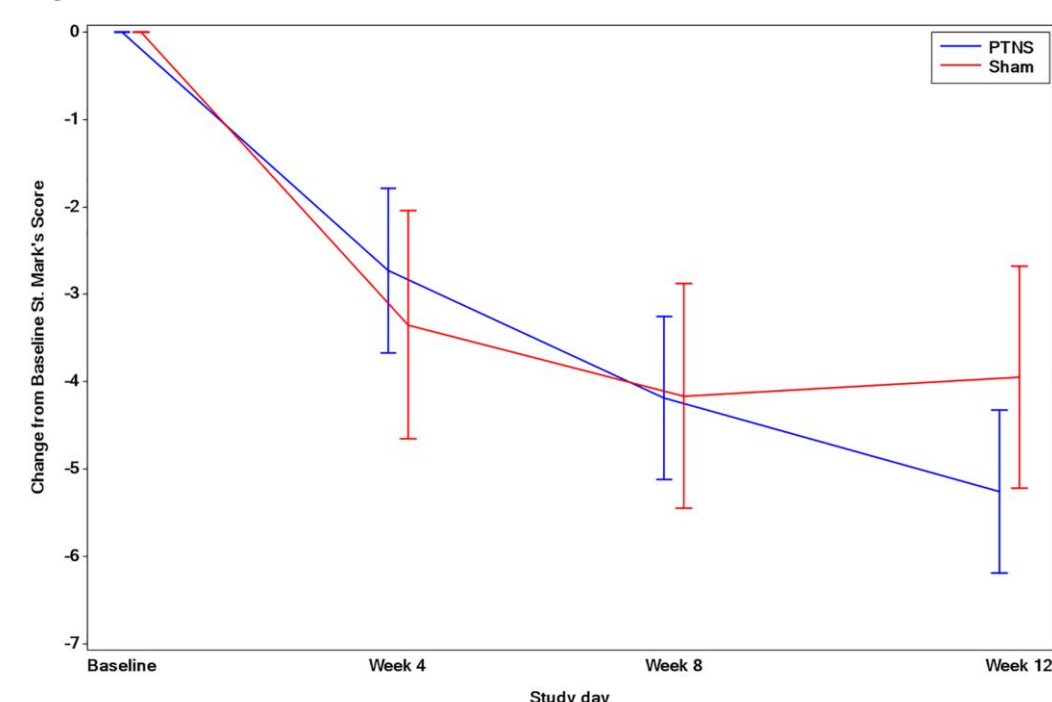
## Results

**Bosch-Ramírez, M., et al. (2023)** assessed PTNS effectiveness on FI long term in patients over 18. Clinical reassessment was at three, six, twelve, and thirty-six months. 139 patients participated from 2010 to 2017, showing PTNS improvements, especially in partial responders. Patients with low Wexner scores and short sickness duration responded well.

**Carrillo, R. R., et al. (2021)** assessed the connection between distal response, nerve position, and accommodation with clinical response in FI patients undergoing PTNS treatment. 32 patients were studied, revealing no association between clinical/manometric changes and nerve localization. Clinical progress was linked to motor response and anal canal length increase. A stronger clinical response appears to be connected to motor response during PTNS, while accommodation might result in less favorable outcomes.

## Results

**Zyczynski, H. M., et al. (2022)** compared PTNS and sham stimulation for FI in women, with 166 PTNS and 55 sham participants. Results found no significant difference in improving FI or quality of life. Adverse events were reported in 4% of participants, the comparison of St. Mark's score improvement. After 12 weeks, PTNS did not differ from sham in symptom reduction, refuting its efficacy for female FI.



**Van Der Wilt, A. A., Et Al. (2017)** assessed PTNS for FI through a single-blind RCT, After 9 weeks, PTNS group had 50% fewer FI episodes than the sham group. Both groups have a decrease in FI scores, with PTNS group having a greater reduction.

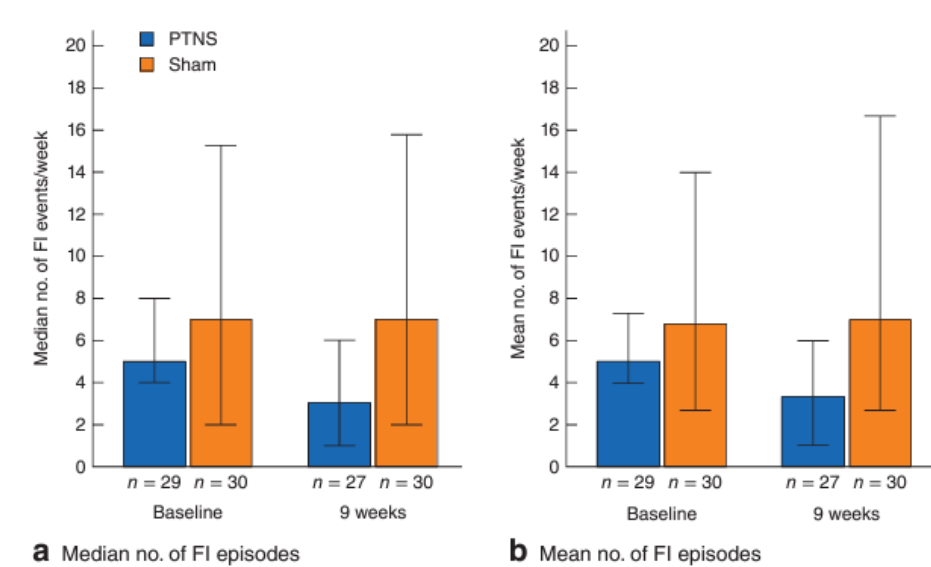


Fig. 2 a Median and b mean number of faecal incontinence (FI) episodes per week for each patient at baseline and follow-up in percutaneous tibial nerve stimulation (PTNS) and sham groups. Because both measures were very skewed, group median values are plotted with i.q.r. represented by error bars

**Sanagapalli, S., et al. (2018)** evaluated posterior tibial nerve stimulation for FI in multiple sclerosis patients, showing high response rates and improved quality of life.

## Discussion

Research studies provide significant data on the effectiveness of PTNS for FI, highlighting different aspects of its potential and effectiveness. Promising results from a long-term PTNS study showed optimal responses in patients over a year, with baseline variables predicting favorable reactions. PTNS may benefit FI patients not responding to conservative therapy, reducing the need for invasive procedures.

The comprehensive evaluation aimed to assess PTNS effectiveness across various studies, showing improvement in treatment results, incontinence severity, and quality of life. PTNS was found helpful in reducing incontinence events and extending deferral time for defecation. However, long-term interventions are needed to maintain PTNS effects and advantages over time. A randomized controlled trial comparing PTNS with sham stimulation for FI in women had mixed results, with PTNS showing symptom reduction after 12 weeks but not significantly differing from sham treatment. Further research is needed to determine PTNS's efficacy in different patient populations. High-quality data is required for noninvasive second-line treatments for FI in the Neuromodulation for Accidental Bowel Leakage trial design. Some studies suggest positive outcomes for PTNS in treating FI, while others emphasize the need for further research to clarify its efficacy and role in clinical practice. Larger RCTs and long-term follow-up studies are crucial for understanding PTNS benefits and optimizing its use in FI management.

## Conclusions

PTNS appears to be a promising therapy option for FI, with evidence suggesting that symptoms and quality of life can improve. However, more well-designed trials with bigger sample sizes and longer follow-up periods are required to validate these findings and determine the appropriate application of PTNS treatments for FI. Standardization of treatment techniques and a thorough study of adverse events will be crucial in directing clinical practice and improving patient treatment.

## References

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