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Review Article

Physiotherapeutic interventions for overactive bladder

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ABSTRACT

Overactive bladder (OAB) is a common urinary disorder characterized by urgency, frequency, nocturia, and urge urinary incontinence (UUI), which can significantly impair quality of life (QoL). This study aimed to review the effectiveness of physiotherapeutic interventions in the management of OAB. Relevant studies published between 2013-2026 were collected from PubMed, Google Scholar, ResearchGate, and Cochrane Library. Outcome measures commonly used across the studies included OAB symptom score (OABSS), OAB questionnaire (OAB-q), international consultation on incontinence questionnaire OAB (ICIQ-OAB), dysfunctional voiding scoring system (DVSS), visual analogue scale (VAS), bladder diaries, uroflowmetry parameters, QoL questionnaires, pad tests, and frequency-volume charts. A total of 22 studies were included based on predefined eligibility criteria, including 10 studies on electrotherapeutic modalities, 5 studies on therapeutic exercises, and 7 studies examined the combined effects. Regarding the study population, 5 studies were conducted on children, 11 studies on women, and 6 studies included both men and women, while no study exclusively investigated only men. Findings demonstrated electrotherapeutic modalities such as transcutaneous tibial nerve stimulation (TTNS), transcutaneous electrical nerve stimulation (TENS), interferential current (IFC) and biofeedback significantly reduced urinary urgency, frequency, nocturia, and UUI while improving QoL. This study concludes that therapeutic exercises, including pelvic floor muscle training (PFMT), bladder training, urge suppression techniques and bladder training (BT), showed significant improvements in OAB symptoms and bladder control. Studies investigating combined interventions, particularly behavioral advice and PFMT (BA-PFMT), TTNS with behavioral therapy, and PFMT combined with tibial nerve stimulation, reported greater clinical benefits compared with single interventions. The existing studies indicate both electrotherapeutic modalities and therapeutic exercises are effective, safe, and non-invasive treatments for OAB. However, the combination of these approaches results in superior outcomes, leading to greater reductions in symptoms, enhanced bladder control and improved QoL.

Keywords: Overactive bladder, Outcome measures, Urinary incontinence, Nocturia, Behavioral therapy, Biofeedback, Quality of life

INTRODUCTION

Overactive bladder (OAB) is the presence of urinary urgency, accompanied by frequency and nocturia, with or without the occurrence of urgent urinary incontinence (UUI), provide that no urinary tract infection or other evident pathology is present.¹ Globally, OAB is a highly prevalent condition, with approximately 546 million individuals estimated to be affected worldwide in 2018, as cited in the study published in advances in therapy (2021).²

A population-based study published in 2011 involving 10,000 individuals from Europe reported that symptoms of OAB were present in approximately 36% of men and 43% of women aged over 40 years.³ OAB is subclassified in dry OAB and wet OAB. The approximate ratio of OAB-dry and OAB-wet is 2 to 1 and the prevalence of OAB-wet increases with advancing age.⁴ Dry OAB patients feel the urge to urinate, but never leak urine. Patients with wet OAB experience episodes of incontinence regularly. Classically, individual with OAB report an urgent need to

void that is difficult to suppress, frequently associated with urge incontinence.⁵

Older age is a well-defined risk factor for OAB incidence and severity, yet limited information exists about OAB risk factors that occur earlier in life such as pregnancy and childbirth.³ This is often due to the physical stress placed on the pelvic floor muscles and surrounding tissues during pregnancy and delivery. The risk factors include both non-modifiable factors-such as age, sex, menopausal status, and pelvic floor prolapse-and modifiable factors, including overweight, high caffeine intake, nicotine use, and excessive alcohol consumption.⁶

Symptoms of OAB can greatly influence an individual's quality of life (QoL), including increased healthcare visits, sleep disruptions and elevated levels of depression and anxiety.⁶ The principal symptom of OAB is urinary urgency, defined as a sudden, intense need to urinate that is difficult to postpone.⁷ The other symptom of OAB is UUI defined as involuntary leakage of urine, accompanied or immediately preceded by urgency.⁸ Increased daytime frequency is the complaint made by the subjects that they void too often by day. Nocturia is the other symptom characterized by the need to wake from sleep one or more times during the night to pass urine, often affecting sleep quality and overall QoL.⁹

Management of OAB follows a stepwise approach beginning with first-line conservative therapy, progressing to pharmacological treatment, and finally advanced or surgical interventions for refractory cases.⁵ First-line conservative therapy consists of conservative behavioral interventions, including patient education, lifestyle modifications, bladder training (BT), scheduled voiding, weight management and PFMT.³

Second-line treatment includes pharmacological management, primarily antimuscarinic agents and beta-adrenoceptor agonists. Third-line treatment includes advanced or surgical interventions for refractory cases such as augmentation cystoplasty and urinary diversion procedures.⁵

Previous studies have reviewed electrotherapeutic modalities for the treatment of OAB and effect of various therapeutic exercises to improve symptoms in patients with OAB.⁵

However they did not consider the combined effect of electrotherapeutic modalities and therapeutic exercises, highlighting the need for further evidence-based research to establish safe, effective and clinically applicable physiotherapy interventions for OAB.

The aim of this study is to find out the effectiveness of electrotherapeutic modalities combined with therapeutic exercises for the management of OAB.

METHODS

Scientific literature relevant to physiotherapy for OAB in India, published between 2013 and 2026, was searched. The search was performed online for English language articles through popular databases such as Google Scholar, PubMed, Cochrane Library, using keywords overactive bladder, outcome measures, urinary incontinence, nocturia, children, women, men, behavioral therapy, biofeedback, and QoL.

Screening of the reference lists of the retrieved articles for any relevant research was also done.

The following eligibility criteria were used for the selection of the articles (Table 1).

Table 1: Criteria for including studies.

Criteria	Description
Design	RCTs, Observational studies Quasi experimental studies, case studies
Participants	Men, women and children
Interventions	Physiotherapy interventions
Comparisons	Electrotherapeutic modalities and therapeutic exercises
Outcome measures	OABSS, ICIQ-OAB, OAB-q, PPBC, Bladder diary, pad tests, post-void residual urine, voided volume, and urgency severity scales

Studies were excluded if they involved non-overactive bladder populations, were published in languages other than English, or had no full-text availability. Review articles and studies using interventions other than electrotherapeutic modalities and physiotherapeutic exercises were also excluded.

RESULTS

Table 2 includes 10 studies evaluating electrotherapeutic modalities for OAB. Transcutaneous tibial nerve stimulation (TTNS) was studied most often, with 3 studies reporting improvement in symptoms and 1 showing no significant benefit. Transcutaneous electrical nerve stimulation (TENS) and interferential current (IFC) also showed positive effects.

Comparative studies found mixed results between percutaneous transcutaneous electrical nerve stimulation (PTENS) and percutaneous tibial nerve stimulation (PTNS), while electrical muscle stimulation (EMS) showed greater improvement than TENS.

Overall, electrotherapeutic modalities appear beneficial for OAB, although their effectiveness varies across interventions.

Table 2: Effectiveness of electrotherapeutic modalities for the management of overactive bladder.

S. no.	Author	Study type	Age group and sample size	Variables	Description of intervention	Result	Conclusion
1	Barroso et al, 2013 ¹⁰	A prospective comparative clinical study	59 children with isolated OAB. Two groups: PTNS group (n=22), PTENS group (n=37)	Visual analog scale (VAS) and DVSS	PTNS group: Needle electrodes were placed near the medial malleolus and stimulation was given at 20 Hz, 400 μ s for 30 minutes once weekly for 12 sessions. PTENS group: Surface electrodes were placed bilaterally over S2–S3 and stimulation was delivered at 10 Hz, 700 μ s for 20 minutes, three times weekly for 20 sessions	The result showed both PTENS and PTNS significantly reduced DVSS scores ($p<0.001$), with PTENS showing a significantly higher complete response rate than PTNS ($p=0.02$)	PTENS was more effective than PTNS in improving OAB symptoms in children; however, further large-scale studies are recommended
2	Paula et al, 2017 ¹¹	A prospective randomized controlled trial	3-18 years, 16 children with OAB. Two groups: A control group (n=8), an experimental group (n=8)	VAS, Rome III criteria, and Bristol stool scale. Assessments were done before treatment, after 20 sessions, and 60 days post-treatment	Participants were divided into control (CG) and experimental (EG) groups. The EG received urotherapy with PTENS (10 Hz, 700 μ s, individually tolerated intensity), while the CG received urotherapy with placebo stimulation. Both groups underwent 20 weekly sessions of 20 minutes. Urotherapy focused on improving voiding habits and fluid intake	No significant differences were found between groups in urinary frequency, voiding diary measures, constipation, or urinary incontinence. However, after 60 days, the experimental group showed significant improvement in urgency and dry nights in children with enuresis ($p=0.03$). They also reported greater overall symptom improvement after treatment and at 60-day follow-up ($p=0.05$ and 0.04)	Once-weekly PTENS may help reduce OAB symptoms, particularly urgency and enuresis, in children. Larger studies are needed to confirm these findings
3	Rafaqat et al, 2017 ¹²	A quasi-experimental study	5-12 years, 40 children aged diagnosed with OAB	OABSS-q before and after treatment	IFC therapy was applied to the S2 and S3 dermatomes for 20 minutes at a frequency of 4000 Hz. Treatment continued for 8 weeks with regular follow-up assessments	IFC therapy significantly improved dysuria, urinary frequency, bedwetting, stool frequency, and OAB symptoms ($p<0.05$), indicating an overall reduction in OAB symptoms after treatment	IFC therapy was found to be an effective and beneficial treatment for reducing symptoms and improving QoL in patients with OAB syndrome, recommended
4	Mallmann et al., 2020 ¹³	A randomized clinical trial	Aged 40–76 years, 50 women with OAB symptoms. Two groups: PTENS	KHQ, OAB-V8 and ISI	Participants were divided into PTENS and PTN groups. Both received home-based electrical stimulation for 6 weeks, three times weekly, along with	After 6 weeks, the PTN group showed significantly greater improvement in OAB-V8 scores than the PTENS group ($p=0.019$). No significant	Both PTENS and PTN are effective and safe home-based non-invasive treatments for OAB

Continued.

S. no.	Author	Study type	Age group and sample size	Variables	Description of intervention	Result	Conclusion
			group (n=25), PTN group (n=25)		behavioral therapy including bladder training, urge suppression, and fluid restriction. PTENS was applied over the sacral roots, while PTN stimulation was applied near the medial ankle	differences were found in quality-of-life or symptom scores, and no major side effects were reported	
5	Welk and McKibbin, 2020 ¹⁴	A randomized, double-blind, sham-controlled trial	Middle-aged, 50 adult women. Two groups: sham group (n=24), PTNS group (n=26)	PPBC Secondary outcome: 24-hour pad weight, voiding diary parameters, or condition-specific patient-reported outcomes	Participants were divided into sham and active stimulation groups. TTNS was delivered using surface electrodes over the posterior tibial nerve for 30 minutes, three times weekly for 12 weeks. Stimulation was applied at 10 Hz and 200 μ s, with intensity increased to the highest comfortable level or until a toe twitch was observed	No significant differences were found between the sham and active TTNS groups in PPBC scores or responder rates (p=0.77). Secondary outcomes, including pad weight, voiding diary measures, and patient-reported outcomes, also showed no significant differences	TTNS was not effective in significantly improving symptoms of OAB. Further research with larger samples and improved stimulation methods is required
6	Pierre et al, 2021 ¹⁵	A multi-arm RCT with blinded assessment	Over 18 years, 137 women with OAB. Five groups: (1) one leg once weekly (n=26), (2) one leg twice weekly (n=27), (3) two legs once weekly (n=26), (4) two legs twice a week (n=28) and (5) placebo group (n=30)	OAB-V8 and voiding diary	Participants were divided into five groups based on treatment frequency and number of legs treated, along with a placebo group. TENS was applied along the tibial nerve at 10 Hz for 30 minutes, with intensity adjusted to patient tolerance. The placebo group received sessions once weekly for 12 weeks without active stimulation	The one-leg, twice-weekly protocol significantly reduced urinary frequency compared with two-leg, once-weekly treatment and placebo. Nocturia improved with both one- and two-leg protocols, with better results seen in the two-leg, once-weekly group	One-leg stimulation improved urgency, frequency, and incontinence, while two-leg stimulation once or twice weekly improved nocturia in women with OAB
7	Cava and Orlin, 2022 ¹⁶	A prospective, randomized, blinded, controlled trial	Aged more than 21 years, 40 patients with OAB. Two groups: ZIDA treatment group (n=21) and sham control group (n=19)	3-day bladder diaries and QoL questionnaires before and after intervention	Participants were divided into ZIDA treatment (n=21) and sham control (n=19) groups. The ZIDA® system was self-administered at home once weekly for 30 minutes over 12 weeks. It used a textile sock with electrodes placed near the medial malleolus and calcaneus, delivering stimulation at 20 Hz with adjustable intensity	The ZIDA group showed a significantly higher treatment success rate than the sham group (80% vs. 39%, p=0.02). Quality of life also improved significantly, with no major adverse effects reported	Home-based TPTNS using the ZIDA® device is a safe, effective, and non-invasive treatment for Overactive Bladder syndrome and significantly improves patients' quality of life

Continued.

S. no.	Author	Study type	Age group and sample size	Variables	Description of intervention	Result	Conclusion
8	Aydogmus et al, 2025 ¹⁷	A retrospective cross-sectional study	Aged more than 18 years, 56 patients with OAB. Two groups: treatment group (TTNS) (n=30) and a sham control group (n=26)	OAB-V8, ICIQ-UI SF, VAS, I-QOL and 3-day bladder diary. Follow-up evaluations were performed at 3 rd , 6 th , and 12 th months to assess long-term effectiveness	Participants were divided into TTNS and sham groups. The TTNS group received stimulation near the medial malleolus and foot arch at 20 Hz for 30 minutes once weekly for 8 weeks. The sham group received no active electrical stimulation	After 8 weeks, TTNS significantly improved OAB-V8, ICIQ, and VAS scores compared with sham treatment ($p<0.05$). I-QOL improved by at least 50% at 3 and 6 months, but this improvement decreased by 12 months	TTNS is safe and effective for short- and mid-term OAB management, but its benefits may decrease over time. Maintenance sessions every 6–8 months may help sustain the effects
9	Rashid and Sajid, 2025 ¹⁸	A randomized controlled trial	35-60 years, 315 patients with OAB symptoms. Three groups: control, EMS and TENS group (n=105 each)	OABSS. Statistical analysis was done using ANOVA and post hoc tests	The control group received conventional treatment, including medication, bladder training, pelvic floor exercises, and antibiotics. The TENS and EMS groups received additional electrical stimulation. TENS was applied over S2–S3, while EMS targeted the pelvic floor muscles. Sessions lasted 20 minutes, five times weekly for 12 weeks	EMS significantly reduced OAB symptoms compared with both TENS ($p=0.026$) and control ($p=0.003$). TENS showed some clinical improvement, but the difference from the control group was not statistically significant	Both EMS and TENS helped reduce OAB symptoms, with EMS showing greater effectiveness. Both are safe and non-invasive treatment options for OAB management
10	Veiga et al, 2026 ¹⁹	A prospective study	4-14 years, 41 children with OAB symptoms	VAS, DVSS and bladder diary records. Symptoms were evaluated before each session to track progress	PTENS was applied over the S2–S4 region using two 5×5 cm electrodes at 10 Hz and 700 μ s, with intensity adjusted to patient tolerance. Treatment consisted of 20-minute sessions, three times weekly, for 20 sessions	Symptoms gradually improved, with 55.1% of children achieving complete recovery after 20 sessions. More than 50% improvement by the 5th session was a strong predictor of treatment success	The study concluded that TENS is an effective and progressive treatment for OAB in children. A minimum of 20 sessions is recommended for optimal results, and early improvement predicts better final outcomes

Table 3: Effectiveness of therapeutic exercises for the management of overactive bladder.

S. no.	Author	Study design	Age group and sample size	Variables	Description of intervention	Result	Conclusion
1	Lee et al, 2013 ⁶	A prospective study	More than 20 years, 105 patients with idiopathic OAB. 85 patients were found to be eligible for analysis from	ICIQ-OAB, IPSS, OAB-q, SF-36 and PPTB	Systematized bladder training program including urge suppression, delayed voiding, relaxation, and pelvic floor exercises	ICIQ-OAB and IPSS scores showed significant improvement in frequency, nocturia, and urgency ($p<0.05$). The voiding diary also showed improvements in maximum	Systematized bladder training was effective in improving OAB symptoms and quality of life in patients

Continued.

S. no.	Author	Study design	Age group and sample size	Variables	Description of intervention	Result	Conclusion
			which 38 patients were male and 47 patients were female			voided volume, nocturia, and nocturnal polyuria after bladder training	with idiopathic overactive bladder
2	Kulaks-izoglu et al, 2015 ²⁰	A prospective interventional study	Aged 22-54 years, 59 female patients with OAB symptoms	SEAPI-QMM questionnaire and uroflowmetry	A 6-week PFMT program: 1-hour supervised sessions 3 times/week, using Pilates mat and ball exercises, plus aerobic home exercises 4-5 times every other day	After the training program, SEAPI scores improved significantly from 9.8 to 3.4 ($p<0.05$). Flow rates showed no significant change, while voided volume improved and was strongly associated with better symptom scores ($r=0.86$)	PFMT improves OAB symptoms and increases functional bladder capacity, so it can be recommended as first-line therapy or alongside medical treatment in severe cases
3	Fitz et al, 2017 ²¹	A prospective clinical trial	27 women with MUI predominantly showing OAB symptoms, 7 women did not complete the treatment	Pad test, and the OAB-V8 questionnaire, I-QoL questionnaire	A 12-week PFMT program was conducted twice weekly for 40 minutes, along with daily home exercises. Exercises included sustained and fast contractions, individualized using the PERFECT scheme and gradually progressed from lying to sitting and standing positions	PFMT significantly improved urinary symptoms, including urine loss, nocturia, and OAB-V8 scores ($p\leq0.011$). Pelvic floor muscle strength, endurance, and function also improved significantly, along with overall quality of life	The study concluded that PFMT alone is effective in improving OAB symptoms, enhancing pelvic floor muscle function, and increasing QoL in women
4	Pal et al, 2021 ²²	A prospective experimental study	Age ranged from 35 to 66 years, 105 women were recruited, of which 91 completed the study and 14 lost to follow-up	3-day bladder diary and PGI-S	Participants were taught to control urgency using quick pelvic floor contractions, stopping or sitting down, and distraction techniques such as counting, breathing, or talking	Among the 91 women who completed the study, urinary frequency and nocturia decreased, and 76 reported improved urgency ($p<0.001$). Urgency incontinence did not improve significantly, while 51.6% reported feeling much or very much better	Urge suppression with modified fluid intake may help manage female OAB, especially by reducing urgency and improving patient-reported outcomes
5	Burzynski et al, 2022 ²³	A case study	A 25-year-old women presented who due to frequent sensations of bladder pressure and nocturia	The study assessed bladder volume, urgency, pain intensity (NRS), urinary frequency, nocturia, and pelvic pain	The physiotherapy program included manual and myofascial therapy for the lumbopelvic region, pelvic floor, and piriformis, along with trigger point therapy, massage, and relaxation techniques. Ten 40-minute sessions were provided over 6 weeks, along with home stretching exercises	By the final session, the patient reported overall symptom improvement, particularly less frequent bladder pressure. Urinary urgency also improved, with greater bladder capacity observed during assessment	Physiotherapy may be an effective conservative treatment for OAB. An individualized combination of manual therapy and exercises can help reduce symptoms and improve patient outcomes

Table 4: Existing studies related to electrotherapeutic modalities and therapeutic exercises used for the management of overactive bladder.

S. no.	Author	Study design	Age group and sample size	Variables	Description of intervention	Result	Conclusion
1	Voorham et al, 2016 ²⁴	A randomized controlled trial	58 women with OAB. Two groups: an intervention group (n=34) and a control group (n=24)	KHQ, a voiding diary, a 24 h pad-test and vaginal EMG registration of pelvic floor with MAPLe	Participants were divided into intervention and control groups. The intervention group received weekly 30-minute BAPFMT sessions for 9 weeks, including pelvic floor exercises, relaxation, coordination training, urge suppression, and home exercises. The control group received lifestyle and toilet behavior advice	The intervention group showed significant improvements in urgency, pad use, and 24-hour urine leakage compared with the control group ($p<0.05$)	EMG BA-PFMT with MAPLe helped reduce OAB symptoms, improve quality of life, and enhance pelvic floor muscle activity and coordination. It appears to be a useful non-invasive treatment option
2	Bykovie ne et al, 2018 ²⁵	A randomized clinical trial	More than 18 years, 67 women with OAB. three parallel groups: Group I: Lifestyle recommendations (LSR) only (n=22); Group II: LSR + PFMT (n=24); Group III: LSR + PFMT + TPTNS (n=24)	3-day voiding diary and KHQ	Both groups received lifestyle advice for 6 weeks, including weight control, fluid and caffeine reduction, and avoiding bladder-irritating foods and habits. The second group also received an individualized home-based PFMT program based on the PERFECT scheme	Urgency decreased significantly in all three groups, with no significant differences between groups. Urinary frequency also improved in groups II and III, while urinary incontinence decreased significantly only in group II. Some quality-of-life measures improved in group III	All three treatments produced short-term improvement in urgency symptoms in women with OAB; however, long-term effects require further evaluation
3	Rizvi et al, 2018 ²⁶	A single-blinded randomized controlled trial	22-65 years, 147 women with OAB. Three groups: Arm A (n=47) received bladder training, arm B (n=50) received pelvic floor muscle training (PFMT), and arm C (n=50) received PFMT with biofeedback	UDI-SF6 and IIQ-SF7. A bladder diary records urinary	The study included three groups: bladder training with urge suppression, bladder diary, and lifestyle advice; PFMT based on the PERFECT scheme with home exercises; and BA-PFMT using an intravaginal EMG probe under physiotherapist supervision twice weekly	UDI-6 scores improved significantly in all three groups ($p<0.05$), along with better quality of life. Bladder diaries also showed reduced urinary leakage and urgency, while daytime frequency improved in group A	Bladder training, PFMT, and biofeedback-assisted PFMT can effectively improve OAB symptoms and quality of life and may be considered first-line treatments before medication
4	Pekbay et al, 2019 ²⁷	A retrospective study	24 children with resistant OAB. Two groups: group-1 pure OAB (n=17) and group-2 DV/SBO (n=7)	Bladder diary, uroflowmetry-EMG, PFMA and symptom evaluation	Two groups: group-1 pure OAB and group-2 DV/SBO. BA-PFMT standard urotherapy, breathing exercises, pelvic floor muscle	Urgency improved or resolved in most children in both groups (71% and 86%). Other symptoms also showed improvement, with increased maximum voided volume. Pelvic floor muscle	BA-PFMT is an effective, non-invasive treatment for children with refractory OAB. It improves urinary symptoms, bladder capacity, pelvic floor muscle strength,

Continued.

S. no.	Author	Study design	Age group and sample size	Variables	Description of intervention	Result	Conclusion
					relaxation, bladder training, and home exercises	activity improved significantly, with better contraction and relaxation	endurance, and voiding function
5	Paker et al, 2023 ²⁸	A prospective randomized controlled study	18-70 years, 98 women with OAB. Group 1: PFMT alone (n=33), group 2: PFMT + biofeedback (n=32), group 3: PFMT + TTNS (n=33)	A voiding diary, the pad test, OAB-V8, ICIQ-SF. Modified Oxford scale	Group 1: PFMT alone (home + supervised, 12 weeks) group 2: PFMT + Biofeedback (3 sessions/week, 20 min, 12 weeks + home exercises) group 3: PFMT + TTNS (2 sessions/week + electrical stimulation, 12 weeks + home exercises) Lifestyle modifications were advised to all groups (fluid restriction, weight loss, reduce caffeine)	Daytime and nighttime urinary frequency, incontinence, and pad test values significantly decreased after treatment in all three groups (p<0.001). ICIQ-SF and OAB-V8 scores also improved significantly (p<0.01). Group 2 showed a greater reduction in daytime frequency compared with groups 1 and 3 (p=0.045 and 0.014, respectively)	The study concluded that all three conservative treatment approaches are effective in managing OAB symptoms, with similar overall outcomes. However, combining PFMT with BF may offer additional benefits in reducing urinary frequency
6	Barbosa et al, 2026 ²⁹	A randomized controlled clinical trial	60-80 aged, 38 women. Two groups G1 and G2 (19 each)	ICIQ-OAB and 3-day voiding dairy	Two groups G1 and G2 (19 each). group 1 received behavioral therapy only; group 2 received TTNS combined with behavioral therapy	The result demonstrate that all groups showed significant improvements in urinary symptoms and pelvic floor muscle strength (p<0.01). Daytime urinary frequency improved significantly more in Group 2 (p<0.05), with no other between-group differences	Behavioral therapy improved OAB symptoms, but combining TTNS with BT produced better outcomes, especially for urgency and nocturia. TTNS was safe, effective, and well tolerated
7	Matias et al, 2026 ³⁰	A randomized, controlled clinical trial	Aged over 18 years, 110 women with OAB of these 26 women were excluded. Three groups: BT+PFMT (n=26), BT (n=28), and PFMT (n=30)	OAB-V8 questionnaire score <8 and the absence of episodes of urgency urinary incontinence in the voiding diary. Secondary outcomes were urinary symptoms, pelvic floor muscle (PFM) function, outpatient and home adherence to the exercise sets, and subjective cure	Three groups: BT+PFMT, BT, and PFMT. All groups improved PFM function (power, endurance, fast contractions, p<0.001 for all), however PFMT and PFMT+BT had better PFM function compared to BT group (p<0.001 for all)	The combination of behavioral treatment with PFMT was more effective than isolated therapies in the management of female OAB syndrome	The combination of behavioral treatment with PFMT was more effective than isolated therapies in the management of female OAB syndrome

DISCUSSION

Electrotherapeutic modalities

Electrotherapeutic modalities are effective conservative interventions for the management of OAB. Various forms of electrical stimulation such as transcutaneous TTNS, TENS, IFT and biofeedback therapy were found to be effective in reducing the severity of OAB symptoms. The reviewed studies consistently reported improvements in urinary urgency, frequency, decreased nocturia episodes and a reduction in UII. These improvements were often accompanied by enhanced QoL and greater patient satisfaction. The beneficial effects of electrical stimulation results from modulation of sacral and pudendal nerve pathways involved in bladder control. By influencing the neural mechanisms responsible for micturition, electrical stimulation suppresses involuntary detrusor contractions, increase bladder capacity and improve the coordination between bladder and pelvic floor muscle function.

TTNS, biofeedback, TENS, and IFC showed promising benefits in reducing OAB symptoms and improving bladder control. However, TENS results were inconsistent across studies, possibly due to differences in stimulation parameters, electrode placement, treatment duration, and patient characteristics. Overall, these modalities may be useful non-invasive options for OAB management.¹⁰⁻¹⁹

Therapeutic exercises

Therapeutic exercises included in this narrative review highlight the important role of conservative physiotherapy interventions in the management of OAB. The reviewed evidence demonstrated that interventions such as PFMT, bladder training, behavioral therapy, urge suppression techniques, MFR and cognitive techniques contributes 6to significant reduction of OAB symptoms and improvement in QoL. PFMT was consistently associated with improvements in pelvic floor muscle strength, enhanced urethral support and inhibition of involuntary detrusor contractions, leading to reductions in urinary urgency, frequency, nocturia and UII. Bladder training was found to improve bladder capacity and voiding control by encouraging patients to gradually increase the interval between voids, thereby reducing urgency and urinary frequency. Behavioral therapy, including lifestyle modifications, fluid management, dietary adjustments and education regarding bladder habits further enhanced symptom control and promoted long-term self-management.

Urge suppression techniques, including pelvic floor contractions, relaxation, distraction, and controlled breathing, can help reduce urgency and improve bladder control. Cognitive approaches may further reduce anxiety and fear of leakage. MFR may also benefit patients with pelvic floor dysfunction by reducing muscle tension and improving tissue mobility. Overall, these approaches

address both the physical and behavioral aspects of OAB.^{6,20-23}

Electrotherapeutic modalities combined with therapeutic exercises

The studies included in this narrative review suggest that combining electrotherapeutic modalities with therapeutic exercises interventions produces significant improvement in the management of OAB. The integrated approach demonstrated beneficial effects on urinary urgency, frequency, nocturia, UII, symptom severity and QoL. The effectiveness of combined treatment strategy attributed to simultaneously address multiple underlying mechanisms of OAB.

While electrotherapeutic modalities facilitate neuromodulation and improve bladder control, therapeutic exercises and behavioral interventions enhance pelvic floor function, bladder retraining and patient self-management. Studies suggest that combining electrotherapeutic modalities with therapeutic exercises provides enhanced improvements in urinary symptoms, bladder control, and QoL in individuals with OAB than electrotherapeutic modalities and therapeutic exercises alone.

Despite differences in treatment protocols, duration, dosage, and outcome measures, the overall evidence supports combined physiotherapy as a non-invasive and patient-centered approach for OAB.

Addressing both neuromuscular and behavioral factors may improve symptoms and quality of life, although variations between studies make it difficult to identify the most effective approach.²⁴⁻³⁰

CONCLUSION

This review concludes that electrotherapeutic modalities and therapeutic exercises are effective conservative treatments for OAB. TTNS, TENS, PTENS, IFT, PFMT, bladder training, urge suppression, and behavioral therapy generally improved urinary symptoms, bladder control, and quality of life. Combined approaches appeared to provide greater benefits than individual treatments. Overall, physiotherapy offers a safe, non-invasive, and patient-centered option for OAB management. However, larger randomized trials with longer follow-up are needed to establish the most effective treatment protocols and their long-term benefits.

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