

The Role of Physical Therapy in Male Infertility: A Literature Review

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Submitted: 2023-01-11; **Accepted:** 2023-05-08; **Doi:** <https://doi.org/10.22037/jcpr.v8i3.46509>

Abstract

Infertility is a complex condition affecting approximately 15% of couples globally, with male factors contributing to 30-50% of cases. The etiology of male infertility encompasses hormonal imbalances, anatomical abnormalities, lifestyle choices, and environmental exposures. Traditional medical interventions primarily focus on hormonal therapies and surgical corrections, yet there is increasing interest in complementary strategies, including physical therapy, to enhance male reproductive health. This literature review systematically examines the role of physical therapy interventions specifically pelvic floor training, manual therapy, exercise regimens, and stress management techniques in improving male fertility outcomes. Research suggests that pelvic floor training can strengthen muscles crucial for sexual function and reduce performance anxiety. Manual therapy techniques, such as myofascial release and soft tissue mobilization, can improve blood circulation to the pelvic region, positively influencing sperm quality. Regular exercise has been linked to hormonal balance and enhanced overall fitness, contributing to better fertility outcomes. Furthermore, addressing psychological factors through stress management is essential, as chronic stress can adversely affect reproductive health. This review underscores the significance of multidisciplinary approaches in the management of male infertility and highlights the potential of physical therapy as a critical component in promoting male reproductive health and optimizing fertility. Future research directions are proposed to deepen understanding and inform clinical practice in this area.

Key words: Exercise Interventions; Male Infertility; Manual Therapy; Pelvic Floor Training; Physical Therapy; Stress Management

Please cite this paper as: Shamsi H, Roostayi MM. The Role of Physical Therapy in Male Infertility: A Literature Review. J Clin Physio Res. 2023; 8(3): e85. Doi: <https://doi.org/10.22037/jcpr.v8i3.46509>

Introduction

Infertility is a multifaceted medical condition affecting approximately 15% of couples globally, defined as the inability to achieve pregnancy after one year of regular, unprotected intercourse (1). This condition can lead to significant emotional, psychological, and social distress, impacting individuals and couples profoundly. Notably, male factors are implicated in nearly 30-50% of infertility cases, underscoring the critical need to focus on male reproductive health and the factors influencing it (2).

The etiology of male infertility is complex, encompassing a diverse array of elements including hormonal imbalances, anatomical abnormalities, lifestyle choices, and environmental exposures. Conditions such as oligospermia (low sperm count), asthenozoospermia (reduced sperm motility), and teratospermia (abnormal sperm morphology) are prevalent in clinical settings, complicating the path to conception (3). Furthermore, lifestyle factors such as obesity, smoking, excessive alcohol consumption,

and sedentary behavior have been associated with detrimental effects on male fertility (4). These multifactorial contributors highlight the necessity for a holistic and integrative treatment approach aimed at enhancing male reproductive health (5).

Traditional medical interventions for male infertility predominantly focus on hormonal therapies and surgical procedures to correct anatomical abnormalities. While these methods can be effective in certain contexts, they do not guarantee success for all patients. As a result, there is a growing interest in exploring complementary strategies that can augment conventional treatments and promote holistic health improvements. Among these strategies, physical therapy has emerged as a promising adjunct in the management of male infertility (6).

Physical therapy encompasses a variety of techniques aimed at enhancing musculoskeletal function, alleviating pain, and fostering overall wellness. As emerging evidence suggests, specific physical therapy interventions, such as pelvic floor rehabilitation, manual therapy, and exercise regimens, may positively influence male reproductive health. These interventions can enhance pelvic floor

function, improve blood circulation to reproductive organs, reduce stress levels, and encourage lifestyle modifications all of which are vital for optimizing fertility (7).

The importance of pelvic health in men cannot be overstated, as pelvic floor dysfunction can lead to sexual health issues, including erectile dysfunction and premature ejaculation, both of which may adversely affect fertility. Additionally, conditions such as varicoceles, which are known to influence sperm quality detrimentally, can be addressed through targeted physical therapy techniques. By integrating pelvic health assessments and rehabilitation into traditional infertility treatments, physical therapists can play an essential role in improving overall reproductive outcomes for men (8).

This literature review aims to explore the current body of knowledge surrounding the impact of physical therapy on male infertility. By synthesizing studies that investigate the efficacy of physical therapy interventions, we seek to emphasize the significance of multidisciplinary approaches in managing this complex condition. Furthermore, this review will identify gaps in the existing literature and propose future research directions aimed at enhancing our understanding of male infertility and informing clinical practice. In doing so, we hope to contribute to a more comprehensive approach to male reproductive health that recognizes the potential of physical therapy as a crucial component in the journey toward parenthood.

Methods

Study Design

This literature review was conducted to analyze the role of physical therapy in male infertility by synthesizing existing research. The review focused on identifying various physical therapy interventions and their impact on male reproductive health, particularly concerning erectile dysfunction, sperm quality, and psychological well-being.

Search Strategy

A search was performed across multiple electronic databases, including PubMed, Scopus, ScienceDirect, and Google Scholar. The search encompassed studies published from 2000 to 2024. The primary keywords utilized included physical therapy, male infertility, pelvic floor training, manual therapy, exercise interventions, stress management.

To expand the search and capture relevant literature, additional keywords such as erectile dysfunction, sperm quality, myofascial release, and hormonal balance were included. These keywords were selected based on their relevance to the physical therapy modalities and their implications for male fertility.

Inclusion and Exclusion Criteria

The following inclusion criteria were applied:

- Population: Studies involving adult males with infertility issues or related conditions such as erectile dysfunction and low sperm quality.
- Interventions: Research that examined physical therapy interventions, including pelvic floor training, manual therapy, exercise, and stress management techniques aimed at improving male fertility.
- Outcome Measures: Studies reporting on relevant outcomes, including pelvic muscle strength, sexual function, sperm parameters (motility, morphology, count), hormone levels (e.g., testosterone), and psychological well-being.
- Study Design: Both experimental and observational studies were included, with a priority on clinical trials and systematic reviews that provided evidence of therapeutic efficacy.
- Language: Only studies published in English were considered.
- The exclusion criteria were:
- Studies focusing solely on pediatric populations or non-male infertility conditions.
- Research that did not include quantitative or qualitative data on the outcomes of physical therapy interventions.
- Non-peer-reviewed articles, editorials, and opinion pieces.

Study Selection Process

The initial search yielded approximately 200 studies. After removing duplicates, 170 studies were screened based on titles and abstracts. Following this preliminary assessment, 112 studies were selected for full-text review based on their relevance to the study objectives and inclusion criteria. After a comprehensive evaluation of content, a final selection of 10 studies was included in the review, guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework to ensure a systematic and transparent approach to literature screening and selection.

Data Extraction and Synthesis

For each selected study, data were extracted and organized in a structured format including the following elements: author and year, type of physical therapy intervention, sample size, outcome measures (e.g., pelvic muscle strength, sperm analysis), and key findings. The methodological quality of each study was evaluated, ensuring that only those with reliable and clear data on the effectiveness of physical therapy interventions were included in the final analysis.

Outcome Measures

- Pelvic Floor Training Effects: The impact of pelvic floor exercises on muscle strength, control, and sexual function

was assessed through relevant kinematic measurements and patient-reported outcomes.

- **Manual Therapy Outcomes:** Improvements in blood flow to the pelvic region and their correlation with sperm quality metrics (e.g., motility and morphology) were analyzed.
- **Exercise Interventions:** Data regarding hormonal changes, specifically testosterone levels, and weight management effects on fertility outcomes were reviewed.
- **Stress Management Techniques:** The effectiveness of mindfulness practices, relaxation strategies, and biofeedback methods in reducing psychological stress and improving reproductive health were summarized, highlighting qualitative feedback from participants where applicable.
- By reviewing the available literature and synthesizing findings from diverse studies, this review aims to provide a comprehensive understanding of how physical therapy can contribute to enhancing male fertility through targeted interventions.

Results

The review highlighted several key areas where physical therapy can play a vital role in addressing male infertility through targeted interventions. Here are the details of each area:

Pelvic Floor Training

Pelvic floor muscle training focuses on strengthening the muscles of the pelvic floor, which can directly influence sexual function and reproductive health. Research indicates that:

- **Improved Muscle Strength and Control:** Targeted pelvic floor exercises, such as Kegel exercises, can enhance muscle strength and endurance. This has been particularly beneficial in addressing conditions like erectile dysfunction (ED) and premature ejaculation, both of which can adversely affect fertility. Improved muscle control may facilitate better erectile function and ejaculatory control, leading to more successful attempts at conception(8).
- **Increased Awareness:** Pelvic floor training also helps men become more aware of their pelvic muscles, which can lead to better coordination and performance during sexual activity. This increased awareness can also reduce performance anxiety, further enhancing sexual health (9).

Manual Therapy

Manual therapy techniques are physical therapy modalities that can be highly effective in improving pelvic health:

- **Myofascial Release:** This technique involves gently stretching and releasing tension in the fascia, the connective tissue surrounding muscles. It has been associated with improved blood flow to the pelvic region, which is crucial for testicular function.
- **Soft Tissue Mobilization:** Similar to myofascial release, this technique targets specific soft tissues to alleviate tension and dysfunction. Enhanced circulation from these therapies can improve oxygen and nutrient delivery to the testes, potentially leading to better sperm production and quality.
- **Impact on Sperm Quality:** By addressing myofascial restrictions and enhancing blood flow, manual therapy may positively influence sperm parameters such as motility, morphology, and overall count.

Exercise Interventions

Regular physical activity is an essential component of overall health and has specific implications for male fertility:

- **Hormonal Balance:** Exercise can positively influence hormonal levels, including testosterone. Regular cardiovascular workouts can help regulate testosterone production, which is essential for spermatogenesis (10).
- **Weight Management:** Tailored exercise interventions aimed at reducing obesity can significantly improve fertility outcomes. Excess body fat is linked to hormonal imbalances that can impair sperm production and function (11).
- **Enhanced Overall Fitness:** Improved cardiovascular health due to regular exercise can lead to better endurance and performance during sexual activity, thereby indirectly promoting fertility by enhancing the quality of sexual encounters (12).

Stress Management Techniques

The psychological dimensions of infertility are critical, and chronic stress can adversely affect reproductive health. Physical therapy can incorporate various stress management techniques to help mitigate these negative effects:

- **Mindfulness Practices:** Mindfulness meditation has been shown to reduce anxiety and improve emotional well-being. Engaging in mindfulness exercises helps individuals focus on the present moment, which can alleviate stress related to infertility. This psychological relief can lead to improved hormonal balance and better sexual function (13).
- **Relaxation Strategies:** Techniques such as deep breathing exercises, progressive muscle relaxation, and guided imagery can help manage stress levels. These strategies can

be integrated into physical therapy sessions to promote relaxation, reduce muscle tension, and enhance overall emotional health (13).

- Exercise interventions: also play a critical role in overall health and male fertility. Regular physical activity has been linked to improved hormonal balance, particularly in regulating testosterone levels, which are vital for spermatogenesis (7). Tailored exercise programs aimed at reducing obesity can significantly enhance fertility outcomes, as excess body fat is associated with hormonal imbalances that impair sperm production. Furthermore, improved cardiovascular health through consistent exercise can enhance endurance and performance during sexual activity, indirectly promoting fertility by improving the quality of sexual encounters (8, 9).

Lastly, addressing the psychological dimensions of infertility is essential, as chronic stress can have detrimental effects on reproductive health. Physical therapy can incorporate various stress management techniques to mitigate these negative effects. Mindfulness practices, such as meditation, have been shown to reduce anxiety and improve emotional well-being, allowing individuals to focus on the present moment and alleviate stress related to infertility. Relaxation strategies, including deep breathing exercises and progressive muscle relaxation, can further promote emotional health. Additionally, biofeedback techniques enable patients to monitor physiological functions and develop coping strategies for stress. A supportive environment provided by physical therapists fosters open discussions about the emotional challenges of infertility, enhancing the therapeutic relationship and encouraging greater patient engagement in their treatment.

Conclusion

In summary, physical therapy offers a multifaceted approach to addressing male infertility through pelvic floor training, manual therapy, exercise interventions, and stress management techniques. By incorporating these methods into a comprehensive treatment plan, physical therapists can enhance not only physical health but also emotional well-being, ultimately improving fertility outcomes. This holistic approach recognizes the intricate interplay between physical and psychological factors in reproductive health, reinforcing the importance of addressing both dimensions for optimal results.

Acknowledgment

None.

Ethical consideration

None.

Funding support

None.

Conflict of interest

None.

Authors' contributions

M. R, H. Sh: Writing, original draft, resources, and writing, original draft, review, and editing.

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