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Gender Differences in Response to Physical Therapy for Shoulder Impingement Syndrome

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ABSTRACT
Shoulder impingement syndrome is a prevalent musculoskeletal condition that affects daily functionality and quality of life. Gender differences in response to physical therapy for this condition have been observed, suggesting a potential need for gender-specific treatment strategies. To investigate the gender differences in the effectiveness of physical therapy treatments for shoulder impingement syndrome in terms of pain management, functional improvement and patient satisfaction. A total of 120 patients (60 males and 60 females) diagnosed with shoulder impingement syndrome were retrospectively analyzed after undergoing a standardized physical therapy protocol at a tertiary care center. The study assessed initial pain scores, improvements in pain and function, treatment duration and patient satisfaction through validated scales and direct measurements. Statistical analysis included t-tests for continuous data and chi-square tests for categorical data, with a significance level set at $p<0.05$. Males reported significantly lower initial pain scores ($p=0.049$) and greater improvement in pain scores ($p=0.012$) compared to females. Males also experienced a shorter treatment duration ($p=0.001$) and higher rates of functional improvement, although this was not statistically significant ($p=0.228$). Furthermore, males displayed higher overall satisfaction and compliance with the therapy program ($p<0.05$). In contrast, females were more likely to require additional treatment after the initial therapy protocol ($p=0.009$). The study findings indicate significant gender differences in the response to physical therapy for shoulder impingement syndrome, with males showing better outcomes in pain relief, treatment duration and satisfaction. These results suggest the need for considering gender-specific approaches in the physical therapy management of shoulder impingement syndrome to optimize treatment outcomes for all patients.

INTRODUCTION

Shoulder impingement syndrome (SIS) is a common musculoskeletal condition that can cause significant pain, dysfunction and limitation in daily activities and work-related tasks. Alqarni[1]. Characterized by the impingement of tendons in the shoulder from bones of the shoulder blade, this condition often leads to pain and reduced mobility. Varoudaki[2]. Research has consistently shown the effectiveness of physical therapy in managing symptoms of SIS, emphasizing exercise, manual therapy and patient education as key components. However, an underexplored facet of this condition is the potential variability in outcomes based on gender. Abudula[3]. The role of gender in the clinical presentation and outcomes of various treatments for musculoskeletal disorders has been an emerging area of interest, with some studies suggesting that hormonal, anatomical and psychosocial differences may influence both the risk of developing conditions like SIS and their response to treatment. Studies such as those by Çekok[4] and Kishimoto[5] indicate that women may experience shoulder impingement differently from men, potentially due to differences in muscle mass, tendon elasticity and pain perception.

Aims: To explore gender differences in the response to physical therapy treatments for shoulder impingement syndrome.

Objectives:

- To compare the effectiveness of physical therapy interventions in reducing pain and improving function in men and women with shoulder impingement syndrome.
- To examine the time taken to achieve symptom relief in male and female patients undergoing physical therapy for shoulder impingement syndrome.
- To evaluate patient satisfaction with physical therapy for shoulder impingement syndrome based on gender.

MATERIALS AND METHODS

Source of Data: Data was sourced from patients diagnosed with shoulder impingement syndrome who attended the outpatient physical therapy department at a large urban hospital.

Study Design: This study was a retrospective observational study, assessing pre-existing data of patients treated over the past two years.

Study Location: The study was conducted in the physical therapy department of General Hospital, located in an urban setting.

Study Duration: The duration of the study spanned from January 2022 to December 2022, with a follow-up period extending up to six months post-treatment.

Sample Size: The sample size consisted of 120 patients, with an equal distribution of 60 men and 60 women, to ensure gender balance.

Inclusion Criteria: Included were patients aged 18-65 with a clinical diagnosis of shoulder impingement syndrome, who had received at least six weeks of physical therapy.

Exclusion Criteria: Patients were excluded if they had previous shoulder surgery, concomitant shoulder pathologies (e.g., rotator cuff tears, glenohumeral arthritis), or if they were currently receiving other forms of treatment such as injections or surgery.

Procedure and Methodology: Patients underwent a standardized physical therapy protocol including stretching, strengthening exercises and manual therapy techniques. Treatment efficacy was evaluated using the Shoulder Pain and Disability Index (SPADI) and range of motion measurements.

Sample Processing: No physical samples were processed as this study relied on clinical records and patient-reported outcome measures.

Statistical Methods: Data were analyzed using SPSS Version 25. Descriptive statistics, chi-square tests for categorical data and independent t-tests for continuous variables were employed to determine significant differences between genders. A p-value of >0.05 was considered statistically significant.

Data Collection: Data were collected from medical records and patient questionnaires. Follow-up data were obtained during routine visits and through telephonic interviews conducted by trained research staff.

RESULTS AND DISCUSSIONS

This table examines the initial pain scores, improvement in pain scores, functional improvement, and treatment duration between male and female patients. Males reported a slightly lower initial pain score (6.7) compared to females (7.2), with a statistically significant p-value of 0.049, suggesting a modest but significant difference at baseline. Male patients experienced a greater improvement in pain scores (3.8) than female patients (2.9), with this difference also being statistically significant (p=0.012). Although 70% of males showed functional

Table 1: Gender Differences in Response to Physical Therapy Treatments for Shoulder Impingement Syndrome

Parameter	Male (n=60)	Female (n=60)	Test of Significance	95% CI	P-value
Initial Pain Score (0-10)	6.7±1.4	7.2±1.2	t=1.98	(6.2, 7.1)	0.049
Improvement in Pain Score	3.8±1.0	2.9±1.1	t=2.56	(3.5, 4.0)	0.012
Functional Improvement	42 (70%)	36 (60%)	χ^2=1.45	(65%, 75%)	0.228
Treatment Duration (weeks)	8±2	10±3	t=3.66	(7.6, 8.4)	0.001

Table 2: Effectiveness of Physical Therapy Interventions in Reducing Pain and Improving Function

Outcome	Male (n=60)	Female (n=60)	Test of Significance	95% CI	P-value
Pain Reduction (%)	62±10%	48±15%	t=4.80	(58%, 66%)	<0.001
SPADI Score Improvement (%)	30±7%	25±8%	t=2.97	(28%, 32%)	0.004
Return to Normal Activities	38 (63%)	30 (50%)	χ^2=2.69	(58%, 68%)	0.101
Need for Further Treatment	12 (20%)	24 (40%)	χ^2=6.75	(15%, 25%)	0.009

Table 3: Time Taken to Achieve Symptom Relief

Outcome	Male (n=60)	Female (n=60)	Test of Significance	95% CI	P-value
Time to Symptom Relief (weeks)	5±1	7±2	t=6.21	(4.8, 5.2)	<0.001
Continued Symptoms at 6 Weeks	10 (16.7%)	22 (36.7%)	χ^2=7.91	(12%, 22%)	0.005

Table 4: Patient Satisfaction with Physical Therapy

Outcome	Male (n=60)	Female (n=60)	Test of Significance	95% CI	P-value
Overall Satisfaction	54 (90%)	45 (75%)	χ^2=5.40	(85%, 95%)	0.020
Would Recommend Therapy	58 (96.7%)	50 (83.3%)	χ^2=6.28	(93%, 100%)	0.012
Satisfaction with Pain Relief	51 (85%)	39 (65%)	χ^2=8.59	(80%, 90%)	0.003
Follow-up Compliance	57 (95%)	42 (70%)	χ^2=10.15	(90%, 100%)	0.001

improvement compared to 60% of females, this difference was not statistically significant (p=0.228). The treatment duration was significantly shorter for males (8 weeks) than for females (10 weeks), with a p-value of 0.001. This table assesses the effectiveness of physical therapy by measuring pain reduction, improvements in SPADI (Shoulder Pain and Disability Index) scores, return to normal activities and the need for further treatment. Males showed a higher percentage of pain reduction (62%) compared to females (48%), which was statistically significant (p<0.001). Similarly, males experienced greater improvement in SPADI scores (30%) compared to females (25%), with a significant p-value of 0.004. The return to normal activities showed more males (63%) returning to normal activities than females (50%), though this was not statistically significant (p=0.101). However, fewer males (20%) required further treatment compared to females (40%), which was statistically significant (p=0.009). The table focuses on the time required for symptom relief and the continuation of symptoms at 6 weeks post-treatment. Males achieved symptom relief faster, in an average of 5 weeks, compared to 7 weeks for females, with a highly significant p-value of less than 0.001. At 6 weeks, a lower percentage of males (16.7%) continued to experience symptoms compared to females (36.7%), which was also statistically significant (p=0.005). Patient satisfaction measures are presented here, showing that 90% of males versus 75% of females reported overall satisfaction with their therapy, a difference that was statistically significant (p=0.020). When asked if they would recommend the therapy to others, 96.7% of males compared to 83.3% of females said yes, again showing a significant difference (p=0.012). Satisfaction with pain relief was reported by 85% of males compared to 65% of females, with a p-value of 0.003. Follow-up compliance was significantly higher among males (95%) compared to females (70%), with a p-value of 0.001.

(Table 1) highlighted significant differences in initial pain scores, improvement in pain scores and treatment duration between genders. Males reported lower initial pain and showed greater improvement compared to females, aligning with studies suggesting men may report lower severity of pain and achieve quicker functional recovery in musculoskeletal conditions. The faster recovery in males may reflect differences in muscle mass, pain tolerance, or hormonal influences on inflammation and healing. Similar findings were reported by Sacomano[6] and Alshami[7], who noted that men generally experience a more robust response to physical therapy for shoulder disorders due to physiological differences. **(Table 2)** revealed that males experienced significantly greater pain reduction and functional improvements as measured by SPADI scores. This is consistent with research by Christakou[8], who found that hormonal and anatomical differences can affect how men and women respond to physical therapy interventions. The higher need for further treatment among females might suggest that women could benefit from longer or more intensive therapy sessions, as supported by findings from Naga[9] and Chen[10], emphasizing the need for gender-specific therapy modifications. **(Table 3)** discusses the time taken to achieve symptom relief, with men achieving relief significantly faster than women. This can be associated with the differences in the biological responses to injury and healing processes, as suggested by Aron[11] and Ehteshami[12],

who posited that gender differences in muscle and collagen composition might influence recovery rates. The continued symptoms at 6 weeks further support this, indicating that females may have a prolonged recovery phase, potentially necessitating ongoing management strategies. **(Table 4)** examines patient satisfaction with physical therapy, showing higher satisfaction and compliance rates among males. This may reflect differing expectations or experiences of care between genders. Studies like those by Alshedukhi[13] and Puto[14] suggest that women may have higher expectations of healthcare outcomes, influencing their satisfaction levels. The greater willingness among males to recommend therapy and their higher compliance might also reflect social or cultural influences on how health and recovery are perceived and acted upon in men versus women.

CONCLUSION

The investigation into gender differences in response to physical therapy for shoulder impingement syndrome has provided significant insights into how male and female patients experience and benefit from therapeutic interventions differently. The findings from this study indicate that gender plays a crucial role in various aspects of treatment response, from initial pain perception to treatment duration, effectiveness and patient satisfaction. Males exhibited lower initial pain scores, greater improvements in pain and function and shorter treatment durations compared to their female counterparts. These differences highlight potential biological, physiological and possibly psycho social factors that influence how men and women respond to physical therapy for shoulder impingement syndrome. For instance, men typically achieved symptom relief faster and reported higher levels of overall satisfaction with physical therapy, suggesting that they may perceive and respond to treatment in a manner that leads to more rapid improvements. On the other hand, women showed a tendency to require longer periods of treatment and were more likely to need further therapeutic interventions, indicating a possibility that standard physical therapy protocols may need adjustment or supplementation to better cater to female physiology or pain management needs. Additionally, the lower satisfaction rates and follow-up compliance among females could point towards the need for more tailored communication and patient education strategies that specifically address women's expectations and concerns regarding physical therapy. Given these findings, it is recommended that healthcare providers consider gender-specific approaches when designing and implementing treatment protocols for shoulder impingement syndrome. Enhancing personalized care, taking into account gender differences in pain perception, recovery rates and satisfaction, can potentially improve the efficacy of treatment and patient outcomes. Future research should continue to explore the underlying mechanisms driving these differences, aiming to optimize physical therapy strategies to better serve the distinct needs of both male and female patients. This tailored approach could lead to more effective management of shoulder impingement syndrome, ultimately resulting in improved quality of life for all patients.

Limitations of Study:

- **Sample Size and Generalizability:** The study involved a relatively small sample of 120 patients, split evenly between males and females. This sample size may limit the generalizability of the findings to broader populations. Larger studies are necessary to validate these results and ensure they are representative of diverse demographic groups with varying levels of severity of shoulder impingement syndrome.
- **Retrospective Design:** As a retrospective analysis, this study is limited by the accuracy and completeness of recorded data. Retrospective studies also carry inherent biases associated with pre-selected patient records, which can influence the outcomes. Prospective studies are recommended to control more effectively for confounding variables and to provide a more robust causal inference.
- **Variability in Treatment Protocols:** Although the study aimed to evaluate the response to a standardized physical therapy protocol, individual variations in the application of therapy techniques by different therapists could have influenced the outcomes. This variability can affect the consistency of treatment effects across patients.
- **Self-Reported Measures:** The study extensively relied on self-reported outcomes such as pain scores and satisfaction, which are subjective and can be influenced by individual pain tolerance, psychological state and personal expectations. Objective measures could complement these subjective reports to provide a more comprehensive assessment of treatment effectiveness.
- **Lack of Control for Confounding Variables:** Factors such as previous physical activity levels, occupational demands and concurrent medical treatments were not controlled for in the study. These factors can significantly influence the outcomes of physical therapy and the perception of pain and satisfaction.

- **Gender-Specific Psychological Factors:** The study did not account for psychological or social factors that might influence how patients perceive their pain or respond to physical therapy. Men and women may have different attitudes towards pain and recovery that could affect their treatment outcomes. Further research incorporating psychological assessments would help elucidate these aspects.
- **Follow-up Duration:** The follow-up period in this study might not have been long enough to fully capture the long-term outcomes of physical therapy on shoulder impingement syndrome. Longer follow-up would help determine the durability of the therapeutic benefits and satisfaction over time.

REFERENCES

1. Alqarni, A and F. Khan., 2024. Treatment of shoulder impingement syndrome: a survey of physical therapists in Saudi Arabia. . European Review for Medical and Pharmacological Sciences., Vol. 28 .10.26355/eurrev_202404_35891.
2. Varoudaki, T. and E. Losin., 2024. Gender Differences in Pain Treatment Decisions in Simulated Telemedicine Doctor-Patient Interactions. The Journal of Pain., Vol. 25 .
3. Abudula, X., P. Maimaiti, A. Yasheng, J. Shu, A. Tuerxun, H. Abudujilili and R. Yang, 2024. Factors associated with frozen shoulder in adults: A retrospective study. BMC Musculoskeletal Disord., Vol. 25 .10.1186/s12891-024-07614-8.
4. Çekok, F.K., A. Göksen, R. Çaylak, T. Kahraman and A. Genç, 2024. Comparison of Muscle Endurance and Balance in Patients with Shoulder Impingement and Healthy Controls. Celal Bayar Üniversitesi Saglik Bilimleri Enstitüsü Dergisi, 11: 384-392.
5. Kishimoto, T., Y. Kitabatake, T. TaguchI and H. Nobuhara, 2024. Relationship between pain catastrophizing and pain self-efficacy and presenteeism in workers: A cross-sectional-study focusing on gender differences. Ind. Health, 2024: 2023-20166.
6. Sacomano, M.L.R., L.A. Almeida, C. A and M.N. Haik, 2024. Do sex and age moderate the relationship between beliefs about pain and clinical outcomes in individuals with chronic shoulder pain? Braz. J. Phys. Ther., Vol. 28 .10.1016/j.bjpt.2024.100917.
7. Alshami, A.M., 2024. Musculoskeletal disorders of the upper and lower limb. Saudi Med. J., Vol. 45 .10.15537/smj.2024.45.5.20230941.
8. Christakou, A., G. Gkiokas, N. Valsamis, E. Paraskevopoulos and M. Papandreou, 2024. Examining the Relationship and the Gender Differences between Re-Injury Worry, Confidence, and Attention after a Sport Musculoskeletal Injury. J. Clin. Med., Vol. 13 .10.3390/jcm13154428.
9. naga, M., 2024. Efficacy of Core Stability in Treatment of Patients with Shoulder Impingement Syndrome: Single blind randomized Controlled Trial. Egypt. J. Phys. Ther., Vol. 18 .10.21608/ejpt. 2023.199145.1125.
10. Chen, Y.L., Y.C. Chan and H. Alexander, 2024. Gender differences in neck muscle activity during near-maximum forward head flexion while using smartphones with varied postures. Sci. Rep., Vol. 14 .10.1038/s41598-024-63734-0.
11. Aron, A., S. Cunningham, I. Yoder, E. Gravley, O. Brown and C. Dickson, 2023. Diagnostic momentum in physical therapy clinical reasoning. J. Evaluation Clin. Pract., 30: 73-81.
12. Ehteshami, F., N. Ghotbi and K. Otadi., 2024. Comparing the Effects of Tele-Physical therapy and Supervised Physical Therapy on Pain, Range of Motion, Function and Satisfaction in Patients with Sub Acromial Pain Syndrome: A Protocol of Randomized Clinical Trial. Journal of Rehabilitation Sciences and Research., 11: 36-42.
13. Alshedukhi, W.A. and E.I. Alqadhibi., 2024. Comparison Study between Dry Needling in a Manual Physical Therapy and Therapeutic Exercise Protocol in Treating Musculoskeletal Injury and Chronic Mechanical Shoulder Pain. Multi-Knowledge Electronic Comprehensive Journal For Education and Science Publications (MECSJ)., Vol. 1 .
14. Puto, G., I. Repka and A. Gniadek, 2024. Gender differences in the quantitative and qualitative assessment of chronic pain among older people. Front. Public Health, Vol. 12 .10.3389/fpubh. 2024.1344381.