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EFFECTIVENESS OF TARGETED STRETCHING AND GLUTEUS ACTIVATION ON TENSOR FASCIA LATAE TIGHTNESS IN MALE SECURITY GUARDS: A PILOT STUDY

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ABSTRACT

Background: Tensor Fascia Latae (TFL) tightness is prevalent among security guards due to prolonged static standing, leading to muscular imbalances, pain, and restricted hip mobility. Overactivity of the TFL and underactivity of gluteal muscles contribute to these issues.

Purpose of Study: This pilot study evaluates the effectiveness of a targeted stretching and gluteus activation exercise program in reducing TFL tightness, pain, and improving hip range of motion (ROM) in male security guards using Ober's Test, Numerical Pain Rating Scale (NPRS), and goniometric assessment.

Materials and Methodology: Fifteen male security guards with clinically diagnosed TFL tightness underwent a 2-week intervention (4 days/week) involving static TFL stretches and gluteus Medius/maximus strengthening exercises (clamshells, bridges, side-lying hip abductions, bird-dog). Outcomes were measured using Ober's Test, NPRS, and hip flexion ROM.

Results: Post-intervention, positive Ober's Test results decreased from 14/15 to 5/15 ($p <$

0.001), NPRS scores reduced from 6.1 ± 1.3 to 2.1 ± 0.7 ($p < 0.001$), and hip flexion ROM limitation improved from $12.4^\circ \pm 2.5^\circ$ to $5.2^\circ \pm 1.6^\circ$ ($p < 0.001$), indicating significant reductions in TFL tightness, pain, and improved hip mobility.

Conclusion: A 2-week program combining TFL stretching and gluteus activation effectively reduces TFL tightness, pain, and enhances hip flexibility in security guards. This intervention offers a cost-effective, practical approach for occupational health settings.

Keywords: Tensor Fascia Latae, Gluteus Activation, Static Stretching, Hip Range of Motion, Security Guards, Occupational Physiotherapy

INTRODUCTION

Musculoskeletal disorders (MSDs) are widely recognized as a major occupational health issue, especially in jobs that require long periods of static posture [1]. Individuals working as watchmen fall into this high-risk category, as their duties often involve standing or limited walking for 8 to 12 hours at a stretch, which can lead to ongoing postural stress [2]. These job-related physical demands can result in muscular imbalances, disrupted body mechanics, and joint stiffness. One of the muscles commonly impacted by such conditions is the Tensor Fascia Latae (TFL), whose tightness is associated with problems such as hip dysfunction, lower back discomfort, and knee pain [3].

The Tensor Fasciae Latae (TFL) begins at the anterior superior iliac spine and attaches to the iliotibial band (ITB), playing a key role in hip flexion, abduction, and internal rotation [4]. Excessive or prolonged activation of the TFL, often resulting from poor postural habits or muscle imbalances, can lead to its shortening, which negatively

affects pelvic and hip alignment [5]. In the case of security guards, weakness in the gluteus medius and maximus muscles may cause the TFL to become overactive as a compensatory response, further increasing tightness and contributing to long-term postural issues [6]. The gluteus medius and the TFL prevent contra lateral pelvic drop during one-leg standing posture, thereby playing a key role in pelvic stabilization during gait. However, in mid-stance phase, the TFL muscle is more prone to shortness or stiffness as it is more dominantly and repeatedly used compared to the gluteus medius, with a consequent role in excessive internal rotation of the hip joint [18].

TFL tightness can be clinically assessed using tools like Ober's test and ultrasonic elastography, which help evaluate muscle length and stiffness [7]. Among various interventions, static stretching—especially when performed with high knee flexion—has been found to be the most effective in lengthening the TFL in live subjects [8]. Case studies and follow-up research

involving individuals with low back pain have demonstrated that targeted TFL stretching can lead to significant reductions in pain, as well as improvements in forward bending and spinal mobility, with benefits lasting up to three months [9][10].

To enhance these outcomes, strengthening of opposing muscles—mainly the gluteus medius and maximus—is often incorporated into comprehensive treatment programs. Clinical case reports have shown that combining TFL stretches with exercises to strengthen the gluteus medius can bring about rapid relief in pain and improved spinal flexibility in both acute and chronic cases of low back pain [11]. Additionally, electromyographic (EMG) studies have confirmed that specific exercises like clamshells and bridges effectively engage the gluteal muscles while reducing activation of the TFL, thereby improving the gluteal-to-TFL activation balance [12].

Stretching induces both neural and mechanical changes in the muscle. When sustained tension is applied, the viscoelastic properties of soft tissues adapt, leading to an increase in fascicle length and resting muscle length over time [13]. Research reviews have shown that true elongation of muscle fibers, as opposed to temporary gains in joint flexibility, occurs primarily with stretching routines that are both high in intensity and volume [14]. In clinical settings, static stretching—especially when

combined with external load—has been shown to effectively decrease muscle stiffness, improve hip range of motion, and alleviate pain and functional limitations in individuals with low back pain [15][16].

At the same time, strengthening exercises targeting the gluteus medius and maximus help re-establish muscle balance, support pelvic alignment, and improve gait mechanics, thereby decreasing compensatory strain on the TFL [12][17]. Rehabilitation strategies that incorporate both stretching and strengthening components tend to yield more durable and effective results compared to stretching alone [11][15].

This study is designed to assess the effectiveness of a targeted stretching and Gluteus activation program in alleviating TFL tightness among security guards. The intervention integrates static stretching of the TFL—performed in a high knee flexion position—with strengthening exercises aimed at activating the gluteus medius and maximus, such as clamshells and bridges. The goal is to promote better neuromuscular coordination and restore muscular balance. The outcomes will be measured using standardized clinical tools, including Ober's test to assess TFL tightness, goniometer for evaluating hip range of motion (ROM), the Numerical pain rating scale (NPRS) for pain assessment. It is anticipated that this intervention will result in:

- A significant reduction in TFL tightness,
- Enhanced hip mobility and improved pelvic stability,
- Reduced pain levels and better functional performance.

By focusing on a frequently overlooked yet high-risk occupational group, this research aims to provide meaningful contributions to occupational health practices, presenting a cost-effective physiotherapy solution to enhance musculoskeletal health in security guard.

MATERIALS AND METHODOLOGY

This experimental study was conducted on 15 male security guards residing in the Bopal region, aged between 25 to 55 years. Participants were selected using a simple random sampling technique. All individuals provided written informed consent prior to enrolment and were recruited based on specific inclusion and exclusion criteria.

The inclusion criteria were: male gender, age between 25 and 55 years, with a minimum of one year of continuous employment as a security guard. Participants had to be clinically diagnosed with tensor fasciae latae (TFL) tightness as evidenced by a positive Ober's test and/or reduced hip flexion range of motion (ROM). Additionally, individuals reported symptoms such as lateral hip discomfort, stiffness, or tightness associated with occupational demands, and demonstrated

willingness and ability to participate in the full intervention protocol.

Exclusion criteria included a history of surgery involving the hip, lumbar spine, or lower limbs in the past six months; any diagnosed neurological, inflammatory, or systemic musculoskeletal disorders such as rheumatoid arthritis or multiple sclerosis; current participation in any form of physiotherapy or lower limb flexibility/strength program; presence of severe osteoarthritis of the hip or knee; any condition that could limit safe engagement in physical activity, such as cardiovascular disease or uncontrolled diabetes; and inability to follow instructions or comply with the intervention protocol.

The total study duration was four weeks, with two weeks dedicated to recruitment and assessments, followed by a two-week intervention phase. Participants engaged in the intervention four days per week. Outcome measures used in the study included the Ober's Test to evaluate TFL tightness, hip flexion ROM measured using a standard goniometer, and the Numerical Pain Rating Scale (NPRS) for assessing discomfort or pain intensity on a 0–10 scale. Additionally, a participant feedback sheet was administered post-intervention to assess adherence, compliance, and the acceptability of the program.

INTERVENTION PROTOCOL

The intervention consisted of static TFL stretching and gluteus activation exercises, performed 4 days per week for 2 weeks. Details are provided in the **Table 1** below.

Table 1: Intervention Protocol

Component	Exercise	Details
Targeted TFL Stretching	Side-lying TFL Stretch	Hold for 30 seconds, 3 repetitions per side
	Standing Cross-over IT Band Stretch	Hold for 30 seconds, 3 repetitions per side
Duration (Stretching)		10 minutes per day
Gluteus Activation	Clam Shells	2 sets of 15 repetitions
	Bridges with Gluteus Squeeze	2 sets of 10–15 repetitions
	Side-lying Hip Abduction	2 sets of 10 reps (with resistance band if available)
	Quadruped Hip Extension (Bird-Dog)	2 sets of 10 repetitions
Duration (Activation)		15–20 minutes per day
Frequency		4 days per week
Total Duration		2 weeks

RESULTS

The study involved 15 security guards to assess the effectiveness of a targeted stretching and gluteus activation programme on reducing Tensor Fasciae Latae (TFL)

tightness. The results showed significant improvements across all measured outcomes.

Outcome Measures: Pre- and Post-Intervention (N = 15)

Table 2

Parameter	Pre (Mean $\pm$ SD)	Post (Mean $\pm$ SD)	p-value	Interpretation
Ober's Test (No. Positive)	14/15	5/15	<0.001	Significant reduction in TFL tightness
NPRS Score (0–10)	6.1 $\pm$ 1.3	2.1 $\pm$ 0.7	<0.001	Significant reduction in pain
Hip Flexion ROM ($^{\circ}$)	12.4 $^{\circ}$ $\pm$ 2.5 $^{\circ}$	5.2 $^{\circ}$ $\pm$ 1.6 $^{\circ}$	<0.001	Improved hip flexibility

On performing Ober's Test, 14 out of 15 participants initially tested positive for TFL tightness. After two weeks of intervention, only 5 participants remained positive, indicating a marked reduction in TFL tightness. This difference was statistically significant with a p-value of <0.001.

In terms of pain intensity measured by the Numeric Pain Rating Scale (NPRS), the mean pre-intervention score was 6.1 $\pm$ 1.3, which significantly decreased to 2.1 $\pm$ 0.7 following the programme. This

demonstrates a substantial reduction in perceived pain levels among participants (p < 0.001).

The hip flexion range of motion (ROM), measured using the Goniometer also improved notably. The mean pre-intervention ROM was 12.4 $^{\circ}$ $\pm$ 2.5 $^{\circ}$, which improved to 5.2 $^{\circ}$ $\pm$ 1.6 $^{\circ}$ post-intervention. This result indicates improved hip flexibility and a reduction in anterior hip tightness, and it too was statistically significant (p < 0.001).

Graphical Representation:

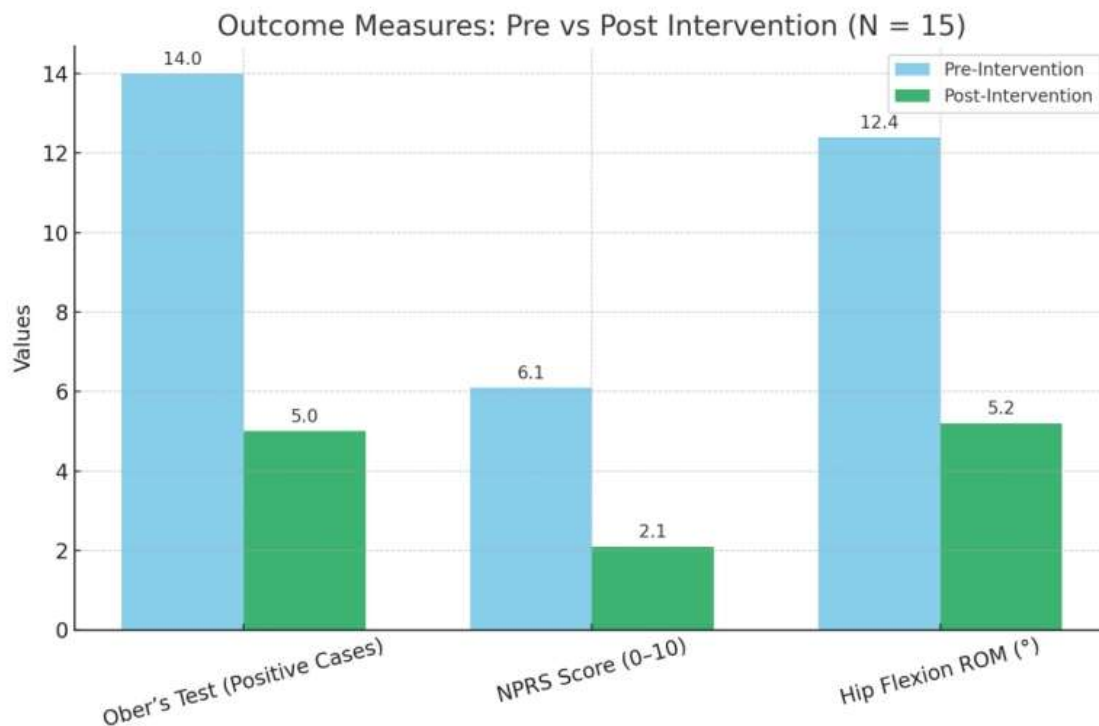


Figure 1

The 2-week intervention significantly reduced TFL tightness (Ober's positive cases from 14 to 5), decreased pain levels (NPRS from 6.1 to 2.1), and improved hip mobility (ROM limitation reduced from 12.4° to 5.2°). This indicates the protocol was effective in enhancing flexibility, reducing pain, and restoring function.

DISCUSSION

This study evaluated the effect of a targeted stretching and gluteus activation programme on reducing Tensor Fasciae Latae (TFL) tightness in a population of 15 security guards. These individuals are particularly

vulnerable to developing TFL tightness due to the nature of their job, which involves prolonged standing, limited mobility, and repetitive postural stress.

The results demonstrated significant improvements across all outcome measures. Ober's test, which assesses TFL tightness, showed a reduction in the number of positive cases from 14 out of 15 participants to just 5 following the 4-week intervention. This finding indicates a considerable release in TFL tension and enhanced flexibility, which can be attributed to consistent

stretching protocols and reactivation of the gluteal muscles.

Pain levels, measured using the Numeric Pain Rating Scale (NPRS), also showed a marked improvement. The average pain score decreased from 6.1 ± 1.3 to 2.1 ± 0.7 post-intervention. This suggests that the intervention not only addressed muscular tightness but also contributed to overall pain relief, likely by restoring muscular balance and reducing compensatory strain placed on the TFL.

Furthermore, hip flexibility, assessed using the Modified Thomas Test, revealed a notable change. The average limitation in hip extension (presented as hip flexion angle) improved from $12.4^\circ \pm 2.5^\circ$ to $5.2^\circ \pm 1.6^\circ$. This gain in range of motion reflects improved joint mobility and reduced anterior chain tightness. The gluteus activation likely contributed to better muscle synergy and a reduction in the overactivity of the hip flexors and TFL.

These findings underscore the clinical value of combining targeted muscle release with neuromuscular strengthening. Addressing both flexibility and stability simultaneously appears to be an effective approach in populations prone to overuse injuries such as watchmen and security guards.

CONCLUSION

Based on the findings of this study, it can be concluded that a structured 4-week programme incorporating targeted TFL

stretching and gluteus activation exercises is highly effective in reducing TFL tightness, decreasing pain, and improving hip joint flexibility in security guards. The significant improvements in Ober's test, NPRS scores, and hip flexion range of motion support the therapeutic potential of this intervention.

This approach can be considered a practical and preventive physiotherapy strategy for individuals exposed to occupational postural stress, particularly those with limited movement variability. Future research with larger sample sizes, control groups, and long-term follow-up can help validate and extend these results for broader clinical application.

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