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IMPACT OF MOBILITY TRAINING ON JOINT RANGE OF MOTION AND FLEXIBILITY AMONG YOUNG WOMEN

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***Abstract*:** This study investigates the effects of Mobility Training (HIIMT) on joint range of motion (ROM) and flexibility among young women. The research employed a pre-test/post-test experimental design involving 30 participants aged 20–23 years, divided equally into an experimental and control group. The experimental group underwent an 8-week MT intervention while the control group followed their usual physical routine. Flexibility and ROM were assessed using a goniometer, sit-and-reach test, and other validated tools. Results demonstrated significant improvements in joint mobility and flexibility in the MT group compared to the control group ($p < 0.05$). The findings suggest that MT is an effective method for enhancing flexibility and joint function in young women.

***Index Terms* –** High Intensity, Mobility, Flexibility, Range of Motion

1. INTRODUCTION

High-Intensity Interval Training (HIIT) has gained widespread popularity due to its ability to improve cardiovascular fitness, strength, and body composition in a short amount of time. HIIT typically involves alternating periods of intense exercise followed by rest or low-intensity periods, offering a time-efficient way to enhance physical performance. While much of the research has focused on the cardiovascular and metabolic benefits of HIIT, more recent studies have explored its impact on other physical attributes, such as joint range of motion (ROM) and flexibility (Behrens & Bader, 2020; García-Pinillos et al., 2017).

The benefits of improving joint ROM and flexibility are particularly important for overall functional movement, injury prevention, and athletic performance. Joint ROM refers to the amount of movement available in a joint, while flexibility pertains to the ability of muscles to stretch and elongate, affecting how easily the body can move (Chtourou & Souissi, 2012). For young women, flexibility and ROM are vital for maintaining healthy musculoskeletal function, especially with increased participation in high-intensity sports and training regimens. Previous research has suggested that activities such as stretching and dynamic mobility exercises are essential for improving flexibility, but the role of high-intensity mobility training remains underexplored (Jeong et al., 2019).

Mobility Training (MT), a variation of HIIT, incorporates mobility exercises with high-intensity intervals to improve flexibility and ROM, targeting both muscular endurance and joint mobility (Schofield & Kippen, 2014). This method combines the benefits of dynamic stretching with the cardiovascular and strength-enhancing components of traditional HIIT, potentially offering a comprehensive training regimen for improving overall body flexibility and joint health. Studies examining the effects of MT on flexibility and ROM specifically among young women are limited, but emerging evidence suggests promising results in enhancing both flexibility and range of motion, leading to improved performance and reduced injury risk (Malek & Mazzetti, 2007; Hegedus et al., 2006).

As young women increasingly engage in fitness routines that demand higher levels of flexibility and joint mobility, understanding the impact of MT on these factors is crucial. This review aims to explore the existing evidence on how MT affects joint ROM and flexibility among young women and to discuss the potential implications for exercise programming and injury prevention.

2. METHODOLOGY

To fulfil the purpose of the study 30 healthy young women were selected from women's hostel perusing master degree at Manonmaniam Sundaranar University, Tirunelveli, and ages ranged between 20 to 23 years. The selected subjects were divided into two equal groups consisting fifteen each. Experimental group - I underwent mobility training for a period of 08 weeks. Group- II acted as control group the subjects in control group were not engaged in any training programme.

2.1 MEASUREMENT TOOLS

- Joint ROM: Goniometer measurements for key joints (e.g., hip, shoulder, knee).
- Flexibility Tests: Sit-and-Reach Test (for hamstring and lower back flexibility).
- Modified Thomas Test (for hip flexor tightness).
- Shoulder Flexibility Test (for upper body mobility).

2.2 MEASUREMENT OF THE RANGES OF MOTION

Hip joints flexion: Subject lay down on supine position and straightened the leg and body but both hands were sprayed sideward.

- Procedure: Approximate bony landmarks were placed for goniometer alignment with (a) Lateral Midline of Pelvis/ Trunk. (b) Greater Trochanter. (c) Lateral Femoral Epicondyle.
- Axis of goniometer is placed on the greater trochanter. Figure 5. Measurement of hip flexion
- Stationary arm of goniometer is placed toward the lateral midline of pelvis.
- Moving arm of the goniometer is placed toward the lateral femoral epicondyle.
- Before measuring the hip flexion, measurement was taken from normal angle or neutral angle (180 degree).
- Instructions were given about the hip joint flexion.
- Subject was asked to bend the knee and flex his hip joints toward the body as much as possible.
- Measured the neutral position to maximum flex position of the hip joint.
- The estimated values were recorded {Total reading of goniometer - neutral angle of hip joints = value of hip flexion} of ROM of neutral position to hip flexion

2.3 TRAINING METHODS

Warm-up (5–10 minutes): Dynamic stretches and light cardio. Main Routine (20–30 minutes): Exercises: Dynamic lunges, hip openers, yoga-inspired sequences, and bodyweight drills. Intensity: 70–85% maximum heart rate (MHR). Work-to-Rest Ratio: 30 seconds of exercise followed by 20 seconds of rest. Cool-down (5–10 minutes): Static stretching and deep breathing.

Statistics Tool

Research Design-A quantitative, experimental pre-test/post-test design with a control group was employed to assess changes in flexibility and ROM. Inclusion Criteria: Healthy, moderately active individuals with no major joint injuries.

Collection of Data

- Pre-Test: Baseline assessments before intervention.
- Post-Test: Conducted after 8 weeks of MT intervention.

3. ANALYSIS AND INTERPRETATION OF DATA

Data were analyzed using SPSS. Paired t-tests assessed within-group differences, and independent t-tests compared experimental and control groups. Statistical significance was set at $p < 0.05$.

Participant Demographics

Mean Age: 22.4 ± 2.3 years

Mean BMI: 23.1 ± 2.8 kg/m²

Table -1
FLEXIBILITY & ROM IMPROVEMENTS

Test	Experimental Group (Pre)	Experimental Group (Post)	Control Group (Pre)	Control Group (Post)
Sit-and-Reach Test (cm)	24.5 ± 3.1	30.8 ± 3.5	| 25.0 ± 3.0	25.5 ± 2.8
Hip Flexion (Degree)	85.2 ± 4.5	95.1 ± 4.3	86.0 ± 4.2	86.4 ± 4.0

Significant improvements were observed in the experimental group for all flexibility and ROM measures ($p < 0.05$). The control group showed no significant changes.

The results suggest that MT effectively enhances flexibility and joint ROM in young women. The dynamic, high-intensity nature of the training likely contributed to improved muscle elasticity, neuromuscular control, and joint mobility.

4. CONCLUSION

The 8-week MT intervention significantly improved joint ROM and flexibility among young women. These findings highlight MT as an effective and practical approach for enhancing mobility. Future research should explore long-term effects and adaptations in other populations.

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