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Integrating Manual Therapy and Exercise: Evaluating the Efficacy of Muscle Energy Technique Combined with Free Exercises in Alleviating Symptoms of Chronic Rheumatoid Arthritis

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Abstract:

Introduction: Autoimmune chronic disease Joint pain, inflammation, and irregularities are RA symptoms. Everyone's physical and emotional health is affected by this awful sickness. RA treatments are being investigated to improve life. Even while medications treat RA, physical therapy is growing. Patients can receive MET for musculoskeletal issues. The effects of MET on chronic rheumatoid arthritis quality of life are unknown. Free MET's impact on chronic rheumatoid arthritis sufferers will be studied. We seek to improve treatment options and empower patients through active rehabilitation by studying this unknown territory. Few have studied advanced manual therapy like MET for RA, making this study intriguing. A comprehensive MET and free exercise study may improve long-term RA patients' clinical processes and quality of life. This study addresses a knowledge gap, recommends future research, and promotes awareness of how advanced manual therapy may improve quality of life for chronic rheumatoid arthritis patients.

Objectives: To determine the impact that the muscular energy technique has on the quality of life of people who suffer from chronic rheumatoid arthritis. To investigate the impact that free workouts have on the quality of life of people who suffer from chronic rheumatoid arthritis.

Conclusion: This study found that free exercises and MET enhanced RA patients' quality of life. Therapeutic interventions targeting systemic inflammation and polyarthritis were guided by HAQ and NRS testing to reduce discomfort, strengthen, and enhance function. Hot moist packs reduced stiffness and NRS values declined quickly during MET and free exercises, relieving discomfort. 30–60-year-olds maintained muscle tone and power with medication and targeted exercises. After isometric relaxation, manual treatment harmonized inputs, reduced discomfort, and improved pain, disability, and joint range. High HAQ ratings suggested better quality of life, suggesting rigorous manual treatment and exercise may assist chronic RA. These findings advise treating rheumatoid arthritis using tailored methods and more investigation.

Keywords: rheumatoid arthritis, muscle energy technique, free exercises, chronic, intervention, Numerical Rating Scale, Health Assessment Questionnaire, hot moist pack, thermotherapy, pain reduction, functional disability, manual therapy, symmetrical polyarthritis, multidimensional approach, outcome measures, inflammatory disorder.

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I. Introduction

Among the chronic autoimmune illnesses, rheumatoid arthritis (RA) presents a formidable obstacle due to its chronic inflammation, joint discomfort, and abnormalities. People of all demographics are impacted by this crippling illness, which has a significant negative impact on one's physical and emotional health [1]. Research into various treatment modalities to reduce symptoms and enhance the quality of life for RA patients is ongoing as efforts to improve the condition's management continue. Physical therapy techniques are becoming more widely acknowledged for their potential advantages, even while conventional medicinal therapies continue to play a crucial role in managing RA [2]. The manual medicine technique known as Muscle Energy Technique (MET), which places a strong emphasis on patient engagement, has drawn interest due to its potential for treating musculoskeletal problems. The use of MET in the setting of persistent rheumatoid arthritis, however, is still little studied, and there is little research on how it affects quality of life [3,4]. The need for a thorough understanding of the impact of MET, especially in conjunction with free activities, on the quality of life of those suffering from chronic rheumatoid arthritis gives rise to the proposed study[5]. By exploring this unexplored area, we hope to offer insightful information that will benefit both the improvement of treatment strategies and the patient's empowerment via active participation in their healing process. The paucity of studies on advanced manual treatment techniques such as MET in the setting of rheumatoid arthritis highlights the importance of this study [6]. A thorough investigation into the efficacy of MET in conjunction with free exercises may prove to be a valuable complement to the current therapeutic toolkit, with the potential to impact clinical procedures and enhance the general[7] quality of life for those coping with the hardships of long-term rheumatoid arthritis. The over6arching objective of this study is to close the knowledge gap, lay the groundwork for further research, and promote a more comprehensive comprehension of the potential benefits of sophisticated manual therapy techniques for improving the quality of life for individuals with chronic rheumatoid arthritis [8-12].

II. Objectives

A. To Assess Muscle Energy Technique's (MET) Effects:

- Evaluate the efficacy of Muscle Energy Technique (MET) for those with rheumatoid arthritis that has been identified as chronic.
- Assess the effects of MET therapies on pain, muscle strength, and joint mobility.

B. To Determine the Impact of Free Exercises:

- Examine how free exercises affect those who have rheumatoid arthritis that lasts a long time.
- Analyze gains in muscular endurance, functional ability, and general physical fitness.

C. To ascertain the combined effects on life quality:

- Analyze how participants with chronic rheumatoid arthritis perceive their quality of life after completing free activities and MET together.
- To evaluate and measure changes in health-related quality of life, apply validated instruments.

D. Comparing Baseline Measurements with MET and Free Exercises:

- Set baseline values for important parameters, such as quality of life, pain thresholds, and joint mobility.
- The effectiveness of MET and free exercises can be measured by comparing post-intervention results with these baseline parameters.

E. To Examine Participant Feedback and Adherence:

- Keep an eye on participants' compliance with the free exercise and MET recommendations.
- Gather qualitative information from participant feedback to comprehend attitudes, encounters, and difficulties related to the interventions.

F. To Add to the Body of Current Literature:

- Contribute to the small amount of research on the use of advanced manual therapy techniques, particularly MET, in the treatment of persistent rheumatoid arthritis.
- Provide evidence-based analyses that will help guide future studies and medical procedures in the area.

G. Investigating Safety and Feasibility:

- Determine whether adding MET and free exercises to the chronic rheumatoid arthritis treatment regimen is feasible.
- Throughout the study, keep an eye out for and record any unfavourable occurrences to guarantee the participants' safety and wellbeing.

H. To Provide Clinical Practice Suggestions:

- Provide a summary of the research and suggestions for using MET and free exercises in the clinical treatment of long-term rheumatoid arthritis.
- Draw attention to possible directions for future study and investigation in the area of manual therapy for autoimmune diseases.

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III. Material & Methods

A. Material

a. **Plinth**: For the administration of muscle energy technique (MET) and any related exercises, a robust treatment table or plinth will be used. The plinth gives the patient a steady platform and enables ideal posture for procedures.
b. **Towel:** While applying MET, towels can be utilized as consoling objects or as supportive props. Tight towel drapes protect the patient's modesty and make it easier for the therapist to reach body parts that are being worked on throughout the intervention.
c. **Pen**: Fordocumentation needs, a normal writing equipment like a pen will be utilized. Recording participant reactions, observations, and any other pertinent data both during and following treatment sessions falls under this category.

B. Methods

- Study Type: An experimental study methodology is used in this investigation.
- Study Design: A randomized clinical trial is how the investigation is set up.
- Sample Size: Thirty individuals in total will be chosen using the following formula:
- Location of Study: The KIMSDU, Karad Department of Physiotherapy will be the site of this investigation.
- Study Duration: Six months are the total anticipated time for this research project.
- Study Population: Participants having a diagnosis of rheumatoid arthritis from a licenced orthopaedic surgeon or physical therapist, regardless of gender, will be given consideration for participation.

IV. Challenges

A. The Presentation Heterogeneity of RA:

Individuals with rheumatoid arthritis (RA) present with a wide variety of symptoms. Customizing therapies to each participant's unique needs is difficult due to the disease's variety in expression.

B. Considering Comorbidity:

Comorbidities are a common occurrence for RA participants, which makes treatment more difficult. A thorough and sophisticated approach is needed to manage RA while addressing these coexisting health conditions.

C. Compliance with Exercise Programmes:

It might be difficult to promote and guarantee regular adherence to recommended exercise routines, particularly when it comes to free workouts that participants complete on their own. Adherence rates may be impacted by elements like motivation, way of life, and perceived effort.

D. Variability in Patient Response to MET:

People may react differently to the muscle energy technique (MET). Adjustments based on individual factors, such as pain threshold, muscular tone, and prior manual therapy experiences, may be necessary to maximise the effectiveness of MET therapies.

E. Limited Applicability of the Results:

The results of this study may not be as broadly applicable as they could be because of the cohort that was chosen and the particular age range (30 to 60 years). Further research with a variety of populations may be necessary in order to extrapolate the findings to a larger population.

F. The outcome measures' subjective nature

Potential biases are introduced by the dependence on subjective outcome measures, such as self-reported Health Assessment Questionnaire (HAQ) scores and the Numerical Rating Scale (NRS) for measuring pain severity. Metrics with an objective approach would strengthen the study's validity.

G. Short-Term Scope of the Research:

The six-month trial period might make it more difficult to record the therapies' long-term effects. Longitudinal research with protracted follow-up times might shed light on how long-lasting benefits are.

H. Time and Resource Restraints:

The scope and depth of interventions may be impacted by resource limitations, such as a lack of skilled staff and time constraints. This might have an impact on how thorough the study's conclusions are.

I. External Factors Affecting Life Quality:

The quality of life may be significantly impacted by variables outside the control of the treatments, such as socioeconomic level, psychological health, and availability

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of healthcare services. Taking these factors into account is difficult.

J. Multidisciplinary Cooperation:

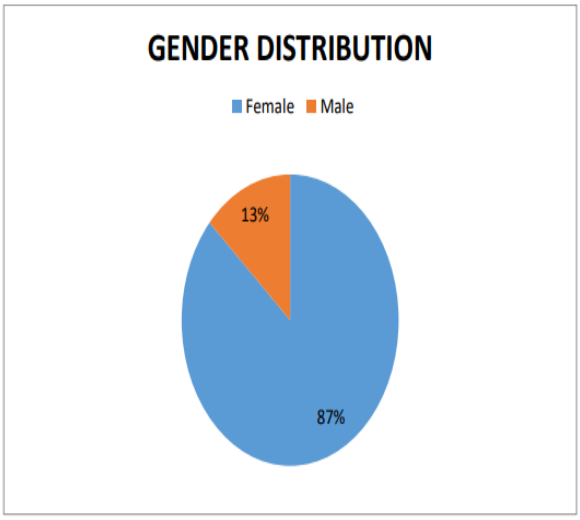
Comprehensive management of RA requires physiotherapists, orthopaedic surgeons, and other healthcare specialists to collaborate effectively. Integrative treatment requires promoting a multidisciplinary approach and overcoming communication hurdles, both of which can be difficult.

V. Result& Discussion

A. Gender Distribution

Sr. no	Gender distribution	Total
1	Male	4
2	Female	26
Total		30

Table 1.Gender Distribution



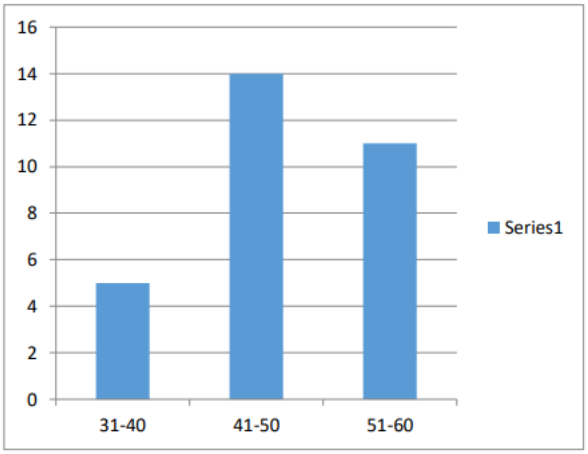
Graph 1. A gender-based distribution

There were 4 men and 26 women.

B. Age wise Distribution

Age	31-40	41-50	51-60
	5	14	11

Table 2. Age wise Distribution

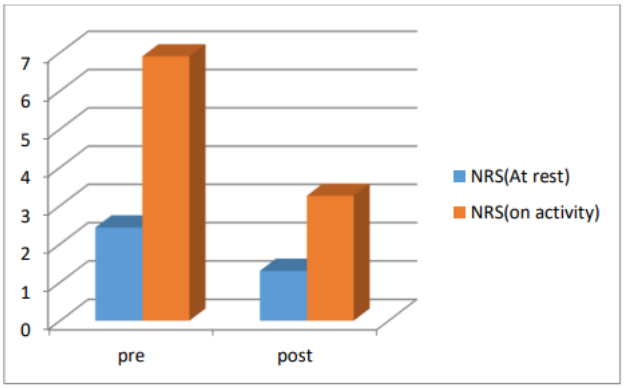


Graph 2. Age distribution

C. Number-based rating

	Pre intervention Mean + SD	Post intervention Mean + SD	P value	Interference
NUMERICAL RATING SCALE(AT REST)	2.43 ± 0.56	1.30 ± 0.46	< 0.0001	Considered Extremely Significant
NUMERICAL RATING SCALE(ON ACTIVITY)	6.9 ± 0.92	3.26 ± 0.58	< 0.0001	Considered Extremely Significant

Table 3: Pre-post numerical rating scale comparison



Graph 3.Pre-post numerical rating scale comparison

The study found that the numerical rating scale's pre-interventional means, both during rest and during activity, were 2.43 ± 0.56 and 6.9 ± 0.92, respectively. After the intervention, there was a significant decrease in the post-interventional mean, which was 1.30 ± 0.46 at rest and 3.26 ± 0.58 during exercise. A paired 't' test statistical analysis produced p-values of less than 0.0001, which indicated an

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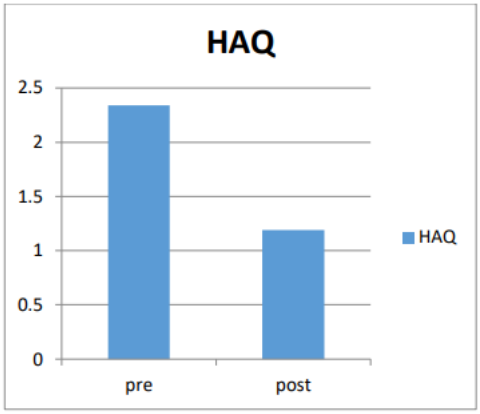
extraordinarily significant difference on the numerical rating scale. The t-values for the intervention's significant effect on lowering pain scores during exercise (t = 19.25) and at rest (t = 14.29) were both suggestive of this.

	Pre intervention Mean + SD	Post intervention Mean + SD	P value	Interference
Health Assessment Quesionnarie	2.34 ± 0.40	1.19 ± 0.25	< 0.0001	Considered Extremely Significant

Table 4.Pre- and post-Health Assessment Questionnaire Comparison



Graph 4. Pre- and post-Health Assessment Questionnaire Comparison

The Health Assessment Questionnaire (HAQ) test had a pre-intervention mean of 2.34 ± 0.40 and a post-intervention mean of 1.19 ± 0.25 in this study. A paired 't' test statistical analysis showed a highly significant difference in the Health Assessment Questionnaire (HAQ) values ($p < 0.0001$, $t = 16.78$).

The inflammatory, symmetrical, systemic, and chronic polyarthritis illness known as rheumatoid arthritis (RA) affects a number of different body tissues. Between 0.5% and 3.8% of women and between 0.15% and 1.37% of males are affected with RA, with the highest frequency in the fourth decade of life. This study's foundation was pre-treatment evaluations using the Health Assessment Questionnaire (HAQ) score and the Numerical Rating Scale (NRS) for pain severity, strength, and functional impairment. This study examined the effects of free workouts and muscular energy method (MET) on the quality of life in people with rheumatoid arthritis in people aged 30 to 60. Participants underwent a 15-minute hot, wet pack therapy prior to performing activities. Clinically, thermotherapy is used to increase joint range of motion and reduce joint stiffness. Specifically, it involves holding a temperature between 40 and 45 degrees for 15 minutes. Patients frequently report feeling comforted by moist heat, despite the paucity of evidence supporting the efficacy of this treatment. The average age of the thirty subjects in the study was 48.53. The NRS values before and after the intervention were 2.43 and 1.30, respectively, showing a statistically significant decrease in pain levels (P =< 0.0001). To preserve muscle tone and build power, free workouts were carried out rhythmically or pendularly by the patient using their own muscles without the assistance of an outside force. Manual therapy has the ability to improve descending pain regulation by harmonising inhibitory and facilitatory input. It is well recognised to enhance performance and maximise the flow of nutrients to the joints. It has been shown that muscle energy strategies, particularly post-isometric relaxation, are effective in reducing pain, disability, and range of motion in joints. Patients' quality of life significantly improved after starting the recommended course of treatment, as indicated by a decline in their Health Assessment Questionnaire (HAQ) scores. The patients' pain and general quality of life showed a statistically significant improvement, with the mean HAQ score before intervention being 2.34 ± 0.40 and after intervention being 1.19 ± 0.25.

VI. Conclusion

In summary, the purpose of this study was to investigate the effects of a combination of muscle energy technique (MET) and free workouts on the quality of life of people suffering from rheumatoid arthritis (RA), a chronic autoimmune disease. RA, which is typified by polyarthritis and systemic inflammation, presents significant obstacles to individuals afflicted, affecting multiple aspects of their quality of life. The baseline for our inquiry was provided by the pre-treatment assessments, which included pain intensity, strength, and functional impairment using the Health Assessment Questionnaire (HAQ) score and the Numerical Rating Scale (NRS). The use of MET in conjunction with free activities showed a considerable reduction in pain scores, as indicated by the significant decline in NRS values following the intervention. In keeping with well-established thermotherapy principles, the use of hot moist pack treatments prior to workouts was intended to improve joint range of motion and reduce joint stiffness. The study cohort, which consisted of participants ranging in age from 30 to 60, demonstrated significant increases in their quality of life after implementing the recommended interventions. Free exercises helped patients maintain muscle tone and improve their power by enabling them to use their muscles without

the need for outside resistance, whether they were performed pendularly or rhythmically. Additionally, manual treatment showed promise in improving descending pain regulation, particularly when it focused on rebalancing facilitatory and inhibitory input. Consistent with previous research, muscle energy techniques—in particular, post-isometric relaxation—showed promise in enhancing reported pain, disability, and joint range of motion. The Health Assessment Questionnaire (HAQ) ratings showed a highly significant increase, indicating a decrease in discomfort and an improvement in the individuals' overall quality of life. This research offers important new information on the possible advantages of combining sophisticated manual therapy methods with exercise schedules in the all-encompassing treatment of persistent rheumatoid arthritis. Our findings point to a promising direction for improving the overall quality of life for RA patients by treating not only the clinical symptoms but also the more general components of well-being. These findings underscore the significance of customised, multifaceted approaches in the continuous search for the best ways to manage rheumatoid arthritis and call for additional investigation and confirmation in larger-scale research.

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