

**PILATES AND PHYSIOTHERAPY ON HAMSTRING TIGHTNESS –  
AN EVIDENCE BASED CASE STUDY**

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**ABSTRACT**

Elderly population and their health care needs life expectancy. Musculoskeletal conditions such as low backache, osteoarthritis of knee joints are common clinical entities recorded among geriatric subjects. This research aims to analyse Pilates and physiotherapy treatment on a subject with lowback ache, early knee osteoarthritis and bilateral Hamstring Tightness Materials & Methodology: This research where 65 year old subject was treated for bilateral hamstring tightness, lowback ache and osteoarthritis knee in Chennai during the period from March 2017 to April 2017. Specific Pilates and

physiotherapy exercises with weekly twice frequency. Results: pre and post VAS ( $P<.05$ ), Womac ( $P<.05$ ) and Oswestry score ( $P<.001$ ) were recorded and statistically analyzed. Conclusion: An improved knee and lowback functions of life as reflected among this study subject with specific Pilates and physiotherapy lessens dependency, increase dignity and self esteem, hence an enhanced quality of life of this geriatric subject was evidenced.

**KEYWORDS:** QOL – Quality of Life, Oswestry Score – Subjective Rating Score Related to lowback Ache and Functions of daily Life, Womac Score – A Subjective Rating Score Reflecting on Knee Joint on Daily Functioning, OA Knee – Osteoarthritis, Geriatrics – Elderly Subjects above 60 Years of Age.

**INTRODUCTION**

1. With global improvements in health, expectancy, associated increase in life number of illnesses and serious health problems among elderly population is associated with structural changes of ageing on musculoskeletal, neurological and other system. This can

reduce the quality of life, increase dependency lowered self esteem and confidence (Spar and La Ro 2002).

2. A significant increase in lowback ache in adults and elderly, in terms of a raise in prevalence, costs, investigations, treatments, disability (Deyo 2009). Disc disorders, back pain and radioculopathy have discrete effect on economy, in terms of days lost to work and reduced productivity as related to common cause of disability with US health care system spending \$ billion annually and lumbar discectomy procedure annual costing to \$ 300 million (Schoenfeld & Weiner 2010)
3. 13% of persons with lowback pain will not recover fully with in 6 months (Carey etal 1996). Recurrent back pain occurs in 25-62% of patients with in one to two years, with up to 33% having moderate pain 15% having severe pain (Stanton etal 2008).
4. 10-30% of acute lowback pain patients evolving in to chronic with frequent relapses and persistence of symptoms of 1 year (Stanton etal 2008)
5. Chronic lowback pain patients who don't have severe neurological deficits can be treated with exercises, education and self care (Weinstein etal 2006) with conservative care quality of life for lumbar radioculopathy patients improves (Spengler etal 1990).
6. Exercise therapy is considered as an effective treatment to reduce self reported pain and improve the back pain specific functional status of participants with chronic lowback pain (Hayden etal 2005)
7. Pilates form of exercises among elders were found to be improving physical functioning (Smith & Smith 2005) dynamic balance, muscle strength and reaction time (Gonul Babay Yigit Irez etal 2011)
8. Rainville etal 2009 has with evidence reported that conservative management aims at to improve patients function and surgery focused on the alternation of structures perceived to be the sources of pain.

#### **Aims & Objectives of this original study was to**

1. Evaluate the efficacy of pilates and physiotherapy on hamstring tightness.
2. Analyse the impact of functional activities with exercises on this subject with hamstring tightness,

O/le

Ambulant unaided

O/E

- Bilateral hamstring tightness
- Restricted inner range hip flexion and extreme knee ranges painful and restricted
- Crepitus increases on active movements of both knee joints left > right
- Obliterated lumbar lordosis
- Tender LS region and left SI joint of grade II
- Nil limb strength discrepancy / varicosities
- No visible deformities of knee, ankle and foot
- Restricted lumbar spine forward flexion
- Hip abductors, extensors bilaterally were 3/5 and hip flexor, hip adductor tightness was noted
- SLR – 60 increases soft tissue symptoms along hamstrings
- SI joint compression test negative

**Provisional Diagnosis:** Mechanical low back ache bilateral hamstring tightness

RX

Hamstring strengthening, Pilates, closed kinematic exercises

#### **MATERIALS AND METHODOLOGY**

1. Clinical first sessions the subjects hamstring was started and quadriceps muscle was strengthening with open kinematic nature using physioball
2. Third and fourth and fifth sessions lumbopelvic core muscles were gradually worked out using Physioball in supine, side and prone postures
3. Six to tenth sessions closed kinematic exercises in supine, side prone and sitting were used using Physioball
4. Number of exercises used per session vary from 10-15, progression was done with number of repetition based on perceived physical exhaustion, heart rate response.
5. Visual analogue scale (VAS from 0-10, a subjective pain rating score) and womac subjective rating scale on 24 items on a 5 point scale, and Oswestry scale on a items on a 6 point scale were used to evaluate the efficacy of core strengthening on this subjects with hamstring tightness once prior to beginning and after 10<sup>th</sup> session of therapy as said above.

➤ This original research was carried between March to April 2017 with weekly twice frequency. Each session lasted from 25-35 minutes. This study subject with bilateral

hamstring tightness, lowback ache and early knee osteoarthritis was treated with specific Pilates and physiotherapy exercises using an air inflated ball for 10 sessions. Due subjects consent for the study was obtained prior. Pre and post womac score, Oswestry score and VAS were recorded, and analyzed statistically.

## RESULTS

**Table 1: Results of pre and post VAS, Oswestry and womac scale of this subject treated with Pilates and physiotherapy.**

Test	Womac Score %	Oswestry Score %	VAS
Pre	62	4.3	8
Post	36	12	3
SD	15	3.21	2.87
SE	8.60	.58	1.66
P	3.00	5.34	3.01
	P<.05	P<.001	P<.05

## DISCUSSION

### 1. Efficacy of Pilates on knee and lowback ailments.

Sekenditz et al 2007 have recorded positive effects of Pilates exercise on abdominal and lower back strength, abdominal muscle endurance and trunk flexibility among 38 sedentary adult female between 30-47 years. 12 week study with effects of Pilates exercises on dynamic balance, reaction time, muscle strength and flexibility among 60 female geriatric subjects were recorded (Gonul Babyigit Irez et al 2011).

### 2. Relationship between hernia repair and lowback pain.

Differential diagnosis of acute lowback pain with compression fracture, spinal stenosis, herniated nucleus pulposus, lumbar strain, spondylosis, systemic and referred causes (MC Intosh and Hall 2011)

### 3. Evidence of various modalities on lowback ache.

Also there is no evidence for bed rest, tractions, manipulations, hot packs, muscle relax mate, opioids (Luister Berg et al 2007). Moderate quality evidence that post treatment exercises programs can prevent recurrence of back pain (Choi et al 2010)

### 4. Hamstring tightness influencing on knee and lowback ache.

Sharma et al 2002 have recorded that 50% of the subjects with lowback ache had hamstrings tightness, and hamstring tightness could lead to an increased patella femoral compressive

force, which may lead to patella femoral syndrome often associated with osteoarthritis (Turner 1994). However Koley and Lidhi 2011 have among 102 Indian subjects of both sex among (Punjab) lowback pain subjects found no correlation between hamstring flexibility and lowback ache.

5. Geriatric subjects with knee and lowback ailments and their functional, quality of life with various physical therapy means.

Promoting and self management programmes despite weak evidence for chronic back pain represent the best way forward (May et al 2010) and acceptance of pain is significantly associated with quality of life (Manson et al 2008). Moderate quality evidence suggests that bed rest is less effective at reducing pain and improving function at 3-12 weeks than a device to stay active (Hagen et al 2004) lowback pain is a very common disorder (Woolf & Pfleger 2013) a leading disability contributor (Lim et al 2010) may result in a reduced level of physical capacity negative psychological effects (Wang et al 2014) and reduction in the quality of life (Gatchel et al 2007).

**Limitations of this research** was only single subject was studied with pain and subjective rating scale were used to analyse treatment outcome. Also the study duration as shorter, hence further recommendations to include larger sample size with control group for longer more variables in design as well tools of measurement.

**Critical Appraisal of this research** where 1. Only Pilates exercises were used 2. Study doesn't have control group 3. With study design 4. Longer duration follow up is required to validate findings of this study report 5. Correlation for herniorrhaphy the study subject underwent in 2012 with present clinical condition was not done 6. This subject with hamstring tightness (Bilateral) and lowback ache were supported by literature for no clinical connectivity 7. Also restricted hip flexion in inner range due to tightness of spinal extensors and relative anterior tilting of the pelvis, the subject has clinically improved with due exercise therapy needs further evidence.

## CONCLUSION

Chronic lowback pain with soft tissue tightness can be effectively treated with Pilates form of exercises, as safe modality among geriatric subjects. Also associated clinical, surgical conditions to be correlated with present condition and due exercise therapy to be prescribed.

The achieved progress should be sustained with due home exercises as an integral part of geriatric care were the major outcome of this research report.

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