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Role of Joint Mobilization in Improving Function and Reducing Pain in Knee Osteoarthritis Patients

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ABSTRACT

Knee osteoarthritis is a degenerative disease of articular cartilage and effect on joint mobility and balance. Mobilization is passive manual therapy which is perform by skill practitioner in order to reduce initial symptoms like pain, swelling, and improve range of motion and joint mobility. The current study investigated the outcomes of Mobilization in knee osteoarthritis patient.The objective of this study is to evaluate Outcomes of knee Mobilization in knee Osteoarthritis.A total of 100 subject were recruited for the study on the basis of inclusion and exclusion criteria after signing the inform consent.It is a cross sectional study conducted in outpatient settings. Results shows statistically that mobilization technique shows positive impact in knee osteoarthritis patients by significant reduction in osteoarthritis symptoms and by enhancing activities of daily living (ADL'S). The present study concluded that mobilization technique can reduce the initial symptoms and increase range of motion in mild to severe knee osteoarthritis patients.

Keyword: *Osteoarthritis, Mobilization, Outcome.*

INTRODUCTION

Osteoarthritis is a degenerative disease of articulating cartilage between two bones. It's a commonest cause of disability in older people's [1] It is a chronic degenerative disorder primarily effecting the articular cartilage of synovial joint, with eventual bony remodeling and overgrowth at the margin of joint. This is

also progression of synovial and capsular thickening and joint effusion. The impairment from OA leads to activity limitation and participation restriction in substantial number of people with significant social and financial impact as a result of surgical and medical intervention. typical onset is in the late 40's to 50's although osteoarthritis may also affect younger people including athletes and people who have sustain joint injury and trauma, about 60% of people living with osteoarthritis are women The knee joint is formed by the fusion of lateral-tibiofemoral medial-tibiofemoral and patello-femoral joint. The joint allows for flexion and extension (and a small degree of medial and lateral rotation) [2]

The knee joint consist of two articulations tibio-femoral the medial and lateral condyles of femur articulating with the tibia patella-femoral the anterior and distal part of femoral articulating with patella. The tibio-femoral joint is weight bearing joint of knee [3] The disease is more prevalent in women than in man with estimate of 18.0% women and 9.6% man above the age of 60 worldwide Experiencing its symptoms [4] In Pakistan, 3.6% in rural and 3.1-4.6% in urban parts of northern Pakistan were found diagnosed by knee osteoarthritis [5]

Characteristics of OA 1.With degeneration, there may be capsular laxity as a result of bone remodeling and capsular distention, leading to hypermobility and instability in some ranges of joint motion.with pain and decreased willingness of capsule and overlying muscles, so as the disease progresses, motion become more limited [6] 2. Although the etiology of OA is unknown, mechanical injury to joint due to major stress or repeated minor stresses and poor movement of synovial fluid when the joint is immobilized are possible causes. Rapid destruction of cartilage occurs with immobilization, because the cartilage is not being bath by moving synovial fluid and is thus deprived of its nutritional supply [7] 3. Some degree of knee OA is also genetically related [8] 4. Other risk factor includes that show the direct relation to OA are, obesity, weakness of quads muscles, joint impact, sports with repetitive impact and twisting. 5.The cartilage splits and thins out, losing its ability to with stand stress. As result crepitation may occur in joint and subchondral bone become exposed.

- During early stages joint usually asymptomatic because cartilage is a neural and avascular but pain become constant at later stage.
- Effected joint become enlarged, haberden's and bouchard's nodes are common.

The clinical characteristics of condition include pain, stiffness, swelling, joint deformity and functional impotence. Whilst at an advance stage muscular dystrophy may also occur which decreases patient's quality of life [9] There is no known cure of osteoarthritis [10] The management of knee osteoarthritis aims to control pain while improving function and quality of life [11]

APTA'S guides to physical therapist practice has defined mobilization as "A manual therapy technique comprised of continuum of skilled passive movement that are applying at varying speeds and amplitudes including a small amplitude/high velocity therapeutic movement [12]

Mobilization with movement is the concurrent application of sustain accessory mobilization applied by therapist and an active physiological movement to end range applied by patient.

The technique applied in a pain free direction correcting joint tracking from a positional fault. [13]

Joint mobilization application following orthokinematic principle are frequently indicated in pathologic condition to relieve pain and restore normal joint motion. Some biomechanical commonalities of the basic mobilization techniques are that:

- Direction of applied force follow normal orthokinematic of joint.
- Magnitude of force controlled to be gentle and compatible with underline pathology 'no forceful movement must ever be used and no abnormal movement must ever be used'.[14]

- Motion of the joint surfaces are small, ranging from barely perceptible to a few millimeter in distance.

By regulating neural tissue, joint mobilization, which entails low velocity passive movement within or at the limit of joint range of motion, lowers pain while enhancing joint mobility numerous recommendations for treating knee osteoarthritis promote joint mobilization, however there is little research to support this practice.

Maitland and mulligan are two types of manual therapy used in osteoarthritis treatment [15] Mulligan mobilization allows the patient to perform the offending movements in a functional position. Hence leading to rewarding of outcome [16]

Maitland mobilization aims to reestablish the spinning, rolling, and gliding motion of two joints [17] The purpose of the study is to evaluate the effects of passive mobilization on knee osteoarthritis in order to determine if passive mobilization enhances activity of daily living, improves quality of life and lowers pain. Maitland mobilization have four grades

- Grade 1: Small-amplitude rhythmic oscillations are performed at the beginning of range. They are usually rapid oscillations, like manual vibrations.
- Grade 2: Large-amplitude rhythmic oscillations are performed within the range, not reaching the limit. They are usually performed at 2 or 3 per second for 1 to 2 minutes.
- Grade 3: large-amplitude rhythmic oscillations are performed up to the limit of the available motion and are stressed into the tissue resistance. They are usually performed at 2 or 3 per second for 1 to 2 minutes.
- Grade 4: Small-amplitude rhythmic oscillations are performed at the limit of the available motion and stressed into the tissue resistance. They are usually rapid oscillations, like manual vibrations.

Grade 1,2: They are primarily used for treating joint limited by pain or muscle guarding. The oscillations may have an inhibitory effect on the perception of the painful stimuli by repetitively stimulating mechanoreceptors that block nociceptive pathways at the spinal cord or brain stem levels. [18] These non-stretched motions help move synovial fluid to improve nutrition to the cartilage.

Grade 3,4: They primarily used as a stretching maneuvers.

Vary the speed of oscillations for different effects, such as low amplitude and high speed, to inhibit pain or slow speed to relax muscle guarding.

The purpose of the study is to evaluate the effects of passive mobilization on knee osteoarthritis in order to determine if passive mobilization enhances activity of daily living, improves quality of life and lowers pain. Kaltenborn describes the grades-of-movement concept, both in terms of joint range and the resistance to movement the practitioners palpates. He also notes the most effective grades of movement for the application of each technique.

Grades of Kaltenborn (Sustain Stretch Mobilization Technique) This grading system describes only joint-play techniques that separate (distract) glide\Translate (slide) the joint surfaces.

- Grade1(loosen): Small-amplitude distraction is applied when no stress is placed on the capsule.it equalizes cohesive forces, muscle tension, and atmospheric pressure acting on the joint.
- Grade 2(Tighten): Enough distraction or glide is applied to tighten the tissues around the joint. Kaltenborn [19] called this ‘‘Taking up the slack’’.

- Grade 3(Stretch): A distraction or glide is applied with an amplitude large enough to place stretch on the joint capsule and surrounding periarticular structures.

Indication of Kaltonborn Grading Grade 1: Distraction is used with all gliding motions and maybe used for relief of pain. Apply intermittent distraction for 7 to 10 seconds with a few seconds of rest in between for several cycles. Note the response and either repeat or discontinue.
Grade 2: Distraction is used for the initial treatment to determine the sensitivity of joint. once the joint reactions is known, the treatment dosage is increased or decreased accordingly.
Gentle grade 2 distraction applied intermittently maybe use to inhibit pain. grade 2 glides maybe used to maintain joint play when range of motion is not allowed.
Grade 3: Distractions or glides are use to stretch the joint structures and thus increase joint play. For restricted joints, apply a minimum of a 6 seconds stretch force followed by partial release (to grade 1 or 2), then repeat with slow, intermittent stretches 3 to 4 seconds intervals.

Rational

Finding out the results of mobilization in patients with knee osteoarthritis is important for our study because osteoarthritis causes cartilage deterioration, which leads to pain and other symptoms that have an impact on the patient's ability to operate physically. In order to enhance quality of life and notice an immediate impact of mobilization in knee osteoarthritis our aim is to observe the clinical benefits of mobilization in patients.

Objective: To determine the outcome of knee mobilization in knee osteoarthritis patients.

Operational Defination

- **Mobilization:** Mobilization is a passive skilled manual therapy technique applied to joints and related soft tissues at varying speeds and amplitudes using physiological or accessory motions for therapeutic purposes.
- **Osteoarthritis:** Osteoarthritis is a chronic degenerative disease primarily affecting the articular cartilage of synovial joints with eventual bony remodeling and overgrowth at the margins of the joints (spurs and lipping).and Osteoarthritis is diagnosed by X-ray.
- **Ballottment Sign:** This is a clinical sign of increased fluid within the knee joint .

  It is examined by placing the palm and hand on the patella pushing caudally and eliciting pressure on the patella with the fingers of the other hands ,when the fluid is increased a wobbling of the patella as in pushing on a ballon is felt.

- **Bulge Sign:** This is a clinical sign for checking the swelling in suprapatellar pouch ,bulge sign confirms the presence of fluid as you try to move fluid from one side of joint to other,
  Gently press just medial of the patella then move the hand in an ascending motion,
  Then press firmly on the lateral aspect of the knee. Commonly no fluid will be appreciated, a medial aspect that bulges out after lateral pressure [positive bulge sign] is consistent with a moderate amount of fluid.

LTERATURE REVIEW

An study was conducted at The outpatient department of Bethany Navajeevan College of Physiotherapy, Thiruvananthapuram and the study design was Pretest-posttest experimental study. The outcome measures were the PPT (pain pressure threshold) and WOMAC (Western Ontario and McMaster Universities Osteoarthritis) scale. For PPT, the post-test values of the experimental group were the median (interquartile range) 10(10-10), mean rank of 30.50, and the sum of ranks of 610.00. The post-test values of the control group were median (interquartile range) 5 (4-5.75), mean rank 10.50, and the sum of ranks 210. 00. For WOMAC, the post-test values of the experimental group were median (interquartile range) 30 (29–30.7),

mean rank 10.50, and the sum of ranks 210.00. The post-test values of the control group were median (interquartile range) 44 (42-45), mean rank 30.50, and the sum of ranks 610.00. The post-test Mann-Whitney U value was < .001; the P value was < .001, which shows that there is a statistically significant difference in post-test values of PPT and WOMAC between experimental and control groups. [20]

A Quasi Experimental study was conducted at physiotherapy department of Kanaan Physiotherapy and Spine Clinic, Lahore from March to September 2020. Pain decreased to greater extent in post treatment of Mulligan's MWM group with mean value 2.64±1.13 as compared to 4.93±1.12 of Maitland Mobilization group. WOMAC Score increased to greater extent in post treatment of Mulligan's MWM with mean value 20±8.52 as compared to Maitland Mobilization group 41.07±9.41 [21].

A randomized controlled trial study was performed at the Department of Physiotherapy, Mayo Hospital, Lahore, Pakistan. The mean pre- and post differences in MWM group were 4.06 ± 0.99, 10.19 ± 3.87, and flexion, and WOMAC Index, respectively. The mean differences of both treatment interventions 19.41 ± 7.58 for VAS, ROM flexion, and WOMAC Index, respectively, while the pre- and post mean difference values for Maitland mobilization group were 3.355 ± 1.05, 10.19 ± 5.5, and 12.28 ± 7.029 for VAS, ROM individually were significant and showed that both were clinically effective in treating the patients of knee OA. [22]

An experimental pre-post study was conducted at Bhausaheb Sardesai Talegaon rural hospital, Pune. At the end of 3 days treatment sessions, both the groups obtained successful outcomes, as measured by significant reductions in VAS ($p < 0.05$) and improvement in 6-minute walk test distance over a 3 days period. However post treatment distance covered in the experimental group (mean =37, SD=16.882) was markedly better than the post treatment distance covered in control group (mean =35, SD=23.146). [23]

An Interventional study was conducted at The OPD of Musculoskeletal Sciences, Ravi Nair Physiotherapy College, Sawangi, Wardha. Results showed statistically significant improvement in both groups for VAS, ROM and functional disability by using student's Paired and unpaired t-test. Group A showed more significant improvement than Group B.[24]

A randomized controlled clinical trial study was approved by the Ethics Committee of the Isfahan University of Medical Sciences. Pain decreased significantly in both groups after intervention ($P<0.001$). The treatment group experienced significantly greater reduction in pain than the control group ($P=0.005$). A significant improvement was found in both static ($P=0.01$) and dynamic ($P=0.006$) balance in the treatment group after the intervention. Additionally, the improvement in static ($P=0.04$) and dynamic ($P=0.02$) balance was greater in the treatment group compared to the control group. [25]

A Randomized, controlled clinical trial study was conducted at physical therapy room at the Balneology Department of Harkány Termal Rehabilitation Centre.Local and distant PPT increased, TUG time and strength of passive resistance decreased immediately, local and distant PPT remained decreased in 6-day and 4-day period, TUG time remained decreased in 6-day period in EMGr (all changes $P\leq0.017$). Local PPT increased imme- diately compared to baseline in nEMGr. In between group comparison, increase of local, distant PPT and strength of passive resistance endures on 2nd day, 4th day and post-intervention, respectively, in EMGr compared to CG. EMGr compared to nEMGr presented significant difference on 6th day and 4th day in local and distant PPT, respectively (all changes $P\leq0.021$). NEMGr presented no significant difference compared to CG on either follow-up. [26]

A Controlled Randomized Clinical trials (RCTs).Six RCTs and randomized crossover studies met the inclusion criteria and were included in the final analysis. The available studies indicated that MT can induce a short-term reduction in pain and an increase in knee ROM and functionality in patients with knee OA. [27]

A Comparative Study was conducted from the different hospitals and physiotherapy clinics in Jaipur. The result of the study shows that both passive joint mobilizations along with exercise and MIMG knee protocol along with exercises were effective to reduce pain, improve function and improve quality of life in chronic OA. However Group B shows significant decrease in pain, improvement in function and improvement in quality of life post intervention and follow -up between the groups.[28]

A randomized controlled trials (RCTs) study based on a total number of 15 RCTs having 704 participants were included. present systematic review suggests that there were significant differences between MWM groups and control groups in terms of visual analogue scale (VAS), Western Ontario and MacMaster Universities Osteoarthritis Index (WOMAC) scale, and flexion range of motion. [29]

An Assessor-blinded, non-randomized interventional trial was conducted at Harkány Thermal Rehabilitation Center.All outcomes improved significantly in both groups. Magnitude of changes was significantly greater in M+CG compared to CG regarding all VAS pain scores, flexion PROM of both knees, right hamstring peak muscle force and 6MWT.[30]

A randomized double-blind (patients and assessor) controlled trial was conducted at Department of Physiotherapy at King Fahd Hospital of the University (KFHU). Compared with sham MWM, MWM resulted in greater immediate improvement in pain [mean difference (95% CI): − 2.2 (− 2.8, − 1.6)], PPT at both the knee [176 (97, 254)] and shoulder [212 (136, 288)], TUG time [− 1.6 (− 2.1, − 1.1)], knee flexor strength [2.0 (1.3, 2.7)] and extensor strength [5.7 (4.1, 7.2)] and knee flexion ROM [12.8 (9.6, 15.9)] (all, $p < 0.001$) but not knee extension ROM [− 0.8 (− 1.6, 0.1)] ($p = 0.067$). After 2 days of intervention, patients who received MWM also demonstrated a greater improvement in pain [− 1.0 (− 1.8, − 0.1)], PPT at the shoulder [107 (40, 175)], TUG time [− 0.9 (− 1.4, − 0.4)], knee flexor strength [0.9 (0.2, 1.7)] and extensor strength [2.9 (2.1, 3.9)] and knee flexion ROM [8.3 (4.7, 11.9)] (all, $p \leq 0.026$). However, WOMAC scores and knee extension ROM showed no evidence of change at any stage after intervention ($p \geq 0.067$).[31]

A Comparative study was conducted from Rehab Care Clinic, Marhaba Poly Clinic, Dabgari Garden, Peshawar and Rehman Medical Institute, Peshawar. Both groups showed significant improvement in ISOA score and VAS. There was statistical significant difference between the two groups (Group A and B) i.e. $p < 0.005$.[32]

A Randomized control trial study was conducted at Physiotherapy department of Civil Hospital, Ahmedabad. The study showed significant improvement in VAS ($p< 0.05$ in control group, $p< 0.001$ in experimental group), WOMAC scale ($p<0.05$ in control group, $p< 0.001$ in experimental group) and distance walked in 6 minute ($p<0.05$ in control group, $p< 0.001$ in experimental group) in both the groups, but all these improvement were highly significant in experimental group ($p< 0.001$) than those in control group.[33]

A Randomized control trail was conducted at Department of Physical Therapy, Railway General Hospital, Rawalpindi, Pakistan. Total 47 participants, were analyzed in which mean age in Experimental Maitland mobilization group A was 45.3±6.06 while mean age in experimental pain release phenomena group B was 45.4±4.59. Between-group analysis for NPRS was significantly improved at post intervention having p value (0.03). Between group comparison of knee ROM and WOMAC also showed significant p value.(p value= <0.05).[34]

MATERIAL AND METHOD

Selection of Patient: We took the diagnosed knee osteoarthritis patient who have been attended recent physiotherapy sessions.

Duration of study: Study conducted after the approval of synopsis and it took 6 months to complete.

Study Design: The Cross sectional study was conducted Because it is a type of observational research that analyzes data from a population at a single point in time.

Study setting: The study was conducted from the different areas of Sindh (Mirpurkhas, Shahdadpur,Tandoadam, Hyderabad, Karachi) .

Sample Size: A sample of 100 participants was selected using convenience Sampling due to time and resource constraints.

Sampling Technique: Non-Probability convenient Sampling was used.

Sampling Tool: The sampling tool used in study was self-structured questionnaire and VAS(visual analog scale).

Inclusion Criteria

- ★ Patient diagnosed with knee OA.
- ★ Adults typical aged > 35 years.
- ★ Chronic symptoms > 3 months.
- ★ Functional limitations.
- ★ Recent physiotherapy/mobilization sessions should be attended.
- ★ Willing to participate.

Exclusion Criteria

- ★ Severe Osteoarthritis.
- ★ Post surgical knee osteoarthritis.
- ★ Inflammatory joint disease.
- ★ Neurological disorders.
- ★ Fracture and Acute trauma.
- ★ Infection or skin disease.
- ★ Knee joint dislocation.

RESULTS

Above mentioned tables shows the data analyses in percentage.
Table no 1: shows that knee osteoarthritis is most common among the age group of 35-54 years as this age group consist of 67%. Table no 2 shows that osteoarthritis is most common in Islam religion and the percentage is 93%. Table no 3 shows that osteoarthritis is more common in housewives and the percentage is 66%. Table no 4 part A and B shows that educated population consist of 76% and graduation population is consist of 48.68%. Table no 5 shows that most cases of osteoarthritis are found in shahdadpur population and the percentage is 37%. Table no 6 shows that osteoarthritis is most common in middle class population and the percentage is 66%. Table no 7 shows that YES to the Question: Do you have knee joint problem contain 100% of percentage. Table no 8 shows that NO to the Question: Do you have any joint related problem except knee joint contain 65% of percentage. Table no 9 shows that among acute and chronic cases Chronic osteoarthritis cases are in greater percentage which contain 76%. Table no 10 shows that YES to the Question: Have you heard any crepitus sound contain 90%. Table no 11 shows the site of knee Osteoarthritis pain and the most common site of pain is Medial side of the knee joint which contain 45%. Table no 12 shows that the intermittent onset of pain contains 52%. Table no 13 shows the intensity of pain and the pain with moderate intensity is more common and contain 65%. Table no 14 shows that Both to the Question duration of pain is more common and contains 67%.

Table no 15 shows that the option ALL to Question which activity aggravate your pain contain 31.8%. Table no 16 shows that option Both of Question: Pain relief by taking contain 63%. Table no 17 shows option YES to the Question Is pain increase in winters contain 84%. Table no 18 shows that Intake of medication contain 88%. Table no 19 shows option YES to the Question of diagnosis test X-Ray which contain 100%. Table no 20 shows the positive response of Buldge test which contain 81%. Table no 21 shows the positive response of Ballottement sign which contain 78%. Table no 22 shows the option YES to the Question: Are you taking physiotherapy sessions which contain 100%. Table no 23 shows that alternate session attended which contain 36%. Table no 24 shows that per-week duration of session which contain 47%. Table no 25 shows the option YES to the Question: Improvement in range of motion after mobilization which contain 94%. Table no 26 shows the option ALL to the Question: Improvement after physiotherapy which contain 26.1%. Table no 27 shows the option YES to the Question: Improvement in activities of daily living (ADL'S) after mobilization which contain 89%. Table no 28 shows the option YES to the Question: Use of knee brace which contain 77%. Table no 29 shows the option NO to the Question: History of hypertension which contain 60%. Table no 30 shows the option NO to the Question: History of diabetes which contain 77%. Table no 31 shows the option NO to the Question: History of arthritis which contain 80%.

It was observed in previous studies that the mobilization is very helpful in relieving the symptoms of knee osteoarthritis and the current study shows the the outcomes of mobilization is increased.
In our study we also found that Grade 1,2 Maitland mobilization is very beneficial in decreasing pain and swelling and Grade 3,4 Maitland mobilization is beneficial in improving range of motion and mobility.
Our study highlights that the short period of mulligan manual therapy,Maitland mobilization therapy, and Kaltenborn mobilization technique have a significant clinically relevant effect on improving outcomes in patients with typical symptomatic knee osteoarthritis.

DEMOGRAPHIC DATA

Table no 1

AGE?

Age group	Frequency	Percentage
35-54	67	67%
55-75	32	32%
75-94	1	1%

Table no 2

RELIGION?

Religion	Frequency	Percentage
Islam	93	93%
Hindu	7	7%

Table no 3

OCCUPATION?

Occupation	Frequency	Percentage
Housewife's	66	66%
Others	22	22%
Teachers	12	12%

Table no 4 (a)

EDUCATION?

Education	**Frequency**	**Percentage**
Educated	76	76%
Uneducated	24	24%

Table no 4 (b)

Education	**Frequency**	**Percentage**
Graduation	37	48.68%
Secondary	30	39.47%
Primary	9	11.84

Table no 5

ADDRESS?

Address	Frequency	Percentage
Shahdadpur	37	37%
Tandoadam	21	21%
Hyderabad	21	21%
Karachi	15	15%
Mirpurkhas	6	6%

Table no 6

SOCIOECONOMIC STATUS?

Socioeconomic status	Frequency	Percentage
Middle	66	66%
Upper	28	28%
Lower	6	6%

Table no 7

KNEE JOINT PAIN?

Knee joint pain	Frequency	Percentage
Yes	100	100%
No	0	0%

Table no 8

JOINT RELATED PROBLEM EXCEPT KNEE JOINT?

Problem except knee joint	Frequency	Percentage
No	65	65%
Yes	35	35%

Table no 9

ACUTE OR CHRONIC?

Chronic or acute problem	Frequency	Percentage
Chronic	76	76%
Acute	24	24%

Table no 10

CREPITUS SOUNDS?

Crepitus	Frequency	Percentage
Yes	90	90%
No	10	10%

Table no 11

SITE OF PAIN?

Site of pain	Frequency	Percentage
Medial	68	45.%
Anterior	50	33.1%
Lateral	23	15.2%
Posterior	10	6.6%

Table no 12

PAIN ONSET?

Onset of pain	Frequency	Percentage
Intermittent	52	52%
Constant	48	48%

Table no 13

PAIN INTENSITY?

Intensity of pain	Frequency	Percentage
Moderate	65	65%
Severe	28	28%
Mild	7	7%

Table no 14

PAIN DURATION?

Pain duration	Frequency	Percentage
Both	67	67%
Day Time	21	21%

Night Time	12	12%

Table no 15

AGGRAVATING ACTIVITY?

Aggravating activity	Frequency	Percentage
All	43	31.8%
Prolong standing	26	19.2%
Climbing	25	18.5%
Walking	24	17.7%
Prolong sitting	17	12.5%

Table no 16 PAIN RELIEVING FACTOR?

Pain Relieving factor	Frequency	Percentage
Both	63	63%
Rest	19	19%
Medication	18	18%

Table no 17

PAIN IN WINTER?

Pain in winters	Frequency	Percentage
YES	84	84%
NO	16	16%

Table no 18

MEDICATION?

Medication	Frequency	Percentage
INTAKE	88	88%
NONE	12	12%

Table no 19

X-RAY?

X-RAY	Frequency	Percentage
YES	100	100%
NO	0	0%

Table no 20

BULGE SIGN?

Bulge sign	Frequency	Percentage
Positive	81	81%
Negative	19	19%

Table no 21

BALLOTTEMENT SIGN?

Ballottement sign	Frequency	Percentage
Positive	78	78%
Negative	22	22%

Table no 22

ARE YOU TAKING PHYSIOTHERAPY SESSION?

Physiotherapy session	Frequency	Percentage
YES	100	100%
NO	0	0%

Table no 23

SESSION ATTENDED?

Physio session Attended	Frequency	Percentage
Alternate	36	36%
1/week	26	26%
Daily	24	24%
3/month	14	14%

Table no 24

DURATION OF SESSION?

Duration of session	Frequency	Percentage
Per\week	47	47%
Per\day	29	29%
Per\month	24	24%

Table no 25

IMPROVEMENT IN RANGE OF MOTION AFTER MOBLIZATION?

IMPROVE ROM	Frequency	Percentage
YES	94	94%
NO	6	6%

Table no 26

IMPROVEMENT AFTER PHYSIOTHERAPY?

Improvement after Physiotherapy	Frequency	Percentage
All	51	26.1%
Pain	48	24.6%
Improve ADL'S	37	18.9%
Increase Range of Motion	33	16.9%
Swelling	26	13.3%

Table no 27

IMPROVEMENT IN ADL'S (ACTIVITY OF DAILY LIVING) AFTER MOBILIZATION?

Improvement ADLS after mobilization	Frequency	Percentage
YES	89	89%
NO	11	11%
IF YES		
Walking	65	38.0%
Cooking	39	22.8%
Washing	28	16.3%

Praying	25	14.6%
Climbing	14	8.1%
Others	0	0%

Table no 28

KNEE BRACE?

Use of knee Brace	Frequency	Percentage
NO	77	77%
YES	23	23%

Table no 29

HISTORY OF HYPERTENSION?

History of hypertension	Frequency	Percentage
NO	60	60%
YES	4O	40%

Table no 30

HISTORY OF DIABETES?

History of Diabetes	**Frequency**	**Percentage**
NO	77	77%
YES	23	23%

Table no 31

HISTORY OF ARTHRITIS?

History of Arthritis	**Frequency**	**Percentage**
NO	80	80%
YES	20	20%

DISSCUSSION

Osteoarthritis is a degenerative disease that worsens over time after resulting in chronic pain. Joint pain and stiffness can become severe enough to make daily tasks difficult.

Osteoarthritis is most common chronic condition in women with the age group in between 40-75 years and the most common site of pain is medial and anterior side of knee joint.

We collect the data from both genders (Males, Females) among the age between 35 and above and we found that the condition is most common in females rather than males because of low vitamin D level, low calcium level, obesity, Hormonal imbalance, Menopause, Genetical impact.

We have performed current study about the outcomes of mobilization in knee osteoarthritis which is based on cross-sectional survey and we collect the data from various cities (Shahdadpur, Hyderabad,Tandoadam, Mirpurkhas,Karachi) and we found positive therapeutic impact of mobilization in knee osteoarthritis patients.

Mobilization is passive manual technique that is performed by skilled practitioner in order to decrease pain, swelling, and relax muscles and improve range of motion in knee osteoarthritis patients. This technique is very useful and performed with multiple method such as patellar mobilization or tibio-femollar joint mobilization.

The outcomes of this technique shows that this is very helpful for knee osteoarthritis patients in order to relieve pain, swelling, increase range of motion and improve Activity of daily living.

It was observed in previous studies that the mobilization is very helpful in relieving the symptoms of knee osteoarthritis and the current study shows the the outcomes of mobilization is increased.

In our study we also found that Grade 1,2 Maitland mobilization is very beneficial in decreasing pain and swelling and Grade 3,4 Maitland mobilization is beneficial in improving range of motion and mobility.

Our study highlights that the short period of mulligan manual therapy,Maitland mobilization therapy, and Kaltenborn mobilization technique have a significant clinically relevant effect on improving outcomes in patients with typical symptomatic knee osteoarthrit

CONCLUSION

In conclusion of study we found that Mulligans (MWM), Maitland mobilization technique, Kaltenborn technique could be treatment option among subjects with knee osteoarthritis. The review supports the evidence that Mulligan's (MWM), Maitland mobilization technique and Kaltenborn technique reduce pain, improve knee range of motion, and physical functioning of subject with knee osteoarthritis.

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