



The Effectiveness of Occupational Therapy Intervention on Functional Autonomy and Quality of life of Elderly having Musculoskeletal Disorders (Osteoarthritis)

Madeeha Jamal * ,Saba Aziz ** , Sandeep Kumar **

*Corresponding Author, Assistant Professor, Department of Occupational Therapy, Jamia Hamdard

** Assistant Professor, Department of Occupational Therapy Jamia Hamdard

** Professor, Department of Orthopaedics, Jamia Hamdard

ABSTRACT

Background: Musculoskeletal disorders are common problems affecting the elderly and it is the main reason for disability. In case of osteoarthritis, they commonly report restrictions in their ability to carry out meaningful everyday activities and often require assistance from others. For these subpopulation, quality of life is referring to old age it must be required to address the broad diversity of ways of aging; that is, from successful aging through usual aging to aging with disability (and dependency). Functional autonomy is considered an important marker to physical fitness, quality of life and elderly health. In this study an attempt made to give occupational therapy intervention focusing on functionality as well as QOL of elderly. **Methodology:** We prospectively assessed functionality and quality of life using, functional Autonomy-SMAF and Quality of Life-WHOQOL (BREF) questionnaire respectively with implementation of 4 weeks of occupational therapy. Pre-post intervention, experimental design was chosen on 30 samples having osteoarthritis with age 60 years and above attending the rehabilitation unit of Jamia Hamdard. Subjects with severe neurological and cardiac issues were excluded from the study. **Result:** Out of 30 subjects, 17 are male and 13 are female. Final data was analysed by

independent t test. In functionality, Basic ADL, IADL and Mobility were significant and in

quality of life physical, psychological and social domain were significant.

Conclusion: The finding of the study suggests that it is possible with association with

conventional therapy occupational therapy intervention and ergonomically advice to decrease

the musculoskeletal disorder, and improve functional autonomy as well as quality of life. The

intervention is simple to administer which can to easily follow by the elderly population at

home.

Keywords:- Occupational Therapy Intervention , Osteoarthritis

INTRODUCTION

Musculoskeletal disorders (MSDs) are injuries or pain in the body's joints, ligaments, muscles, nerves, tendons, and structures that support limbs, neck and back. MSDs can arise from a sudden exertion (e.g., lifting a heavy object), or they can arise from making the same motions repeatedly repetitive strain, or from repeated exposure to force, vibration, or awkward posture. Injuries and pain in the musculoskeletal system caused by acute traumatic events like a car accident or fall are not considered musculoskeletal disorders. MSDs can affect many different parts of the body including upper and lower back, neck, shoulders and extremities (arms, legs, feet, and hands). Examples of MSDs include carpal tunnel syndrome, epicondylitis, tendinitis, back pain, tension neck syndrome, and hand-arm vibration syndrome.

In India, as a result of the change in the age composition of the population over time, there has been a progressive increase in both the number and proportion of aged people. The proportion of the population aged 60 years or more has been increasing consistently over the last century, particularly after 1951. In 1901 the proportion of the population aged 60 or over of India was about 5 percent, which marginally increased to 5.4 percent in 1951, and by 2001 this share was found to have risen to about 7.4 percent. About 75% of persons of age 60 and above reside in rural areas. The elderly population (aged 60 years or above) account for 7.4% of total population in 2001. For males it was marginally lower at 7.1%, while for females it was 7.8%. About 64 per thousand elderly persons in rural areas and 55 per thousand in urban areas suffer from one or more disabilities. Most common disability among the aged persons was loco motor disability as 3% of them suffer from it.

Musculoskeletal disorders are common problems affecting the elderly and it is the main reason for disability. With age, musculoskeletal tissues show increased bone fragility, loss of cartilage resilience, reduced ligament elasticity, loss of muscular strength, and fat redistribution decreasing the ability of the tissues to carry out their normal functions. The loss of mobility and physical independence resulting from arthropathies and fractures can be particularly devastating in this population, not just physically and psychologically, but also in terms of increased mortality rates.

Comprehensive assessment and management of musculoskeletal pain in the older person usually requires a “team” approach with clinicians, physiotherapist, occupational therapist, social worker and community supports working with the patient and family; and rehabilitation programs be promoted to all older people (well or unwell) and tailored individually, with an emphasis on to improve their quality of life.

WHO defines quality of life as: “an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. It is a broad ranging concept affected in a complex way by the person's physical health, psychological state, personal beliefs, social relationships and their relationship to salient features of their environment”. WHO's focus is necessarily a health-related quality of life approach, specifically one that investigates the individual's own views in relation their disease or illness. However, unlike the majority of medical quality of life outcome measures, WHO encompasses psychological and social (i.e. relationships and the environmental) factors which may impact well-being.

QOL is a key concept in environmental, social, medical and psychological sciences, as well as in public policy and in the minds of the population at large; nevertheless, there is no consensus regarding the definition of QOL (Fernández-Ballesteros, in press). Moreover, when QOL is referring to old age it must be required to address the broad diversity of ways of aging; that is, from successful aging through usual aging to aging with disability (and dependency). Consequently, from the very beginning we have to take into consideration that QOL in old age cannot be reduced to QOL in clinical or health settings but must have a general (normal) vision.

A large majority of older adults live in private residences, and report their health as very good or excellent. However, the incidence of chronic illness increases with age, and one in ten people aged 75 and older require assistance with basic activities of daily living. Older adults play key roles in communities. Such roles may include volunteering, working, sharing knowledge and experiences, and care-giving.

Functional autonomy is considered an important marker to physical fitness, quality of life and elderly health. Functional decline is a common condition, occurring each year in nearly 12% of Canadians 75 years of age and older. The model of functional health proposed by the World Health Organization (WHO) represents a useful theoretical framework and is the basis for the SMAF (Système de mesure de l'autonomie fonctionnelle or Functional Autonomy Measurement System), an instrument that measures functional autonomy.

The functional decline syndrome, in which functional autonomy is diminished or lost, may present as an acute condition, i.e., a medical emergency for which the patient must be admitted to a geriatric assessment unit. The sub-acute form is a more insidious condition in which the patient requires comprehensive assessment and a rehabilitation program. A preventive approach based on screening of those at risk and early intervention should prevent or delay the appearance of functional decline or diminish its consequences. Effective strategies for the prevention of or rehabilitation from functional decline will help reduce the incidence of disabilities and the period of dependence near the end of life. These strategies are absolute prerequisites for controlling socio-health expenses and, most importantly, for allowing people to live independently in old age.

Older adults commonly report restrictions in their ability to carry out meaningful everyday activities and often require assistance from others. Standardized functional assessments provide a means for health professionals to analyze a person's abilities to engage in and carry out daily activities. The process of standardization requires an assessment to have undergone rigorous evaluation and have established validity and reliability. Such assessments can be used to determine the effectiveness of treatment, make comparisons across patient groups and amendments to treatment as needed. However, the routine use of standardized functional assessments in disciplines such as allied health is low and use of 'in-house' non-standardized assessments more common. Reasons for limited use of standardized assessments include a lack of time and resources (including financial), and limited knowledge of the most suitable tool to use. In my study an attempt made to give occupational therapy intervention focusing on functional outcomes to improve QOL of geriatric population.

RATIONALE OF THE STUDY

Disability defined in terms of restrictions in the ability to perform activities of daily living (ADL), or, the inability to function independently in terms of basic ADL or instrumental ADL (World Health Organization [WHO], 2003) The most common causes of disability among older adults are reduce in functionality followed by falls and accompanying injury.

Decline in functionality carries an increased risk of poor outcome in older people followed by fatigue, weight loss, muscle weakness, and increased dependency and overall reduce quality of life. There is very little research in the field of functional recovery and service aspect of Geriatrics rehabilitation in India.

In early old age (65-75 years), there may be a modest increase of physical activity, in an attempt to fill free time resulting from retirement (8). By middle old age (75-85 years), many people have developed some physical disability, and in the final stage (very old age, over 85 years) they become totally dependent. A typical expectation is of 8-10 years of partial disability, and a year of total dependency

Role of rehabilitation in restoring independence and quality of life among older persons, models of Functional Rehabilitation etc, are issues of great importance in Geriatric Rehabilitation.

METHODOLOGY

RESEARCH DESIGN : Pre-post intervention, experimental study

SAMPLE DESIGN : Sample of convenience

SUBJECTS: Number of subjects = 30

Age group: 60 years and above

Gender: Male-Female both

METHOD OF INFORMED CONSENT: Written Form (Hindi/English)

INCLUSION CRITERIA:

- Elderly people of age group 60 yrs and above.
- Elderly people having musculoskeletal disorder.

EXCLUSION CRITERIA:

- Severe neurological and cardiac issue who need intensive care.
- Admitted patients recommendation for surgical procedure for any medical reason.

WITHDRAWAL CRITERIA:

- Patients who takes some other treatment in the form of rehabilitation.

INDEPENDENT VARIABLES

1. Exercise programme will be given for the period of 4 weeks.
2. Conventional rehabilitation treatment.

DEPENDENT VARIABLES

1. Functional Autonomy-SMAF (Functional autonomy measurement scale)
2. Quality of Life-WHOQOL (BREF)

OUTCOME MEASURES**SMAF(Functional autonomy measurement scale):**

The Functional Autonomy Measurement System (SMAF) is an instrument developed for the measurement of the needs of the elderly and the handicapped. Its elaboration was based on the World Health Organization's classification of impairments, disabilities and handicaps. A functional autonomy rating scale, using a four-level measurement scale, quantifies a subject's performance on 29 functions in five sectors of activity: activities of daily living, mobility, communication, mental functions and instrumental activities of daily living.

For each function, the evaluator must also estimate available resources to compensate for any identified disability in order to estimate the handicap. The disability and handicap profile obtained is the basis for the prescription of home care or the allocation of chronic care beds. An inter-observer study concluded that the scale is reliable for evaluators from different professions in the community as well as in institutional settings. The instrument is rapid to administer (on average 42 min) and the reliability is not influenced by training.

WHOQOL (BREF) :

The World Health Organization Quality of Life (WHOQOL) project was initiated in 1991. The aim was to develop an international cross-culturally comparable quality of life assessment instrument. It assesses the individual's perceptions in the context of their culture and value systems, and their personal goals, standards and concerns. The WHOQOL instruments were developed collaboratively in a number of centres worldwide, and have been widely field-tested.

The WHOQOL-BREF instrument comprises 26 items, which measure the following broad domains: physical health, psychological health, social relationships, and environment. The WHOQOL-BREF is a shorter version of the original instrument that may be more convenient for use in large research studies or clinical trials.

ETHICAL CONSIDERATIONS

- Informed Consent will be taken from all the subjects and they will be well informed about the nature of study.
- No harm would be caused to the involved subjects.
- Privacy and Confidentiality will be maintained.
- Transference and Counter Transference will not be appreciated

TREATMENT PROTOCOL

- Isometric exercises & strengthening exercises, joint protection techniques and ergonomical advices will be given for patients who are facing musculoskeletal problems(Osteoarthritis).
- Precautions must be explained properly.

OCCUPATIONAL THERAPY INTERVENTION

1. Isometric quadriceps contraction in full extension held for five seconds (subject sits on floor with back supported and legs extended, with rolled up towel under one knee and contracts quadriceps by pushing into the floor against towel)

2. Isotonic quadriceps contraction held in mid flexion for five seconds (subject sits in a chair, lifts lower leg to partially extended position and holds)

3. Isotonic hamstring contraction (subjects lies on front or side and bends knee bringing foot towards body)

4. Isotonic quadriceps contraction with resistance band held for five seconds (as for exercise 2)

5. Dynamic stepping exercise (walking up and down one step/stair)

Exercises were started in the above order and increased to a maximum of 20 repetitions on each leg. Exercises were performed at home on a daily basis.

(Sheila C O'Reilly, Ken R Muir, Michael Doherty Ann Rheum Dis 1999;58:15-19; 12 October 1998)

Occupational Therapy Intervention for Frail Elderly / Oldest Old 85+

- ADL, IADL, work and leisure training including but not limited to treat underlying limitations to safety and independence - physical (strength, hand function, ROM, coordination, balance, endurance, abnormal tone), sensory (tactile, vision, hearing, vestibular, pain), behavioral, cognition and/or perception.
- Address ability to shop, access kitchen, prepare nutritious meals and get adequate hydration.
- Encourage to eat with others.
- Address ability to drive safely.
- Provide referral to driving rehab specialist and/or explore alternative transportation options.
- Train in safe and efficient functional mobility (sit to stand; bed mobility skills; transfers; ambulation and wheelchair mobility) during ADL and IADL tasks.
- Provide functional balance activities to increase balance confidence with ADL tasks.
- Provide UE therapeutic activities and exercises to improve strength and endurance.
- Instruct in home program with verbal and written instructions
- Provide a fall prevention program that includes balance, coordination and agility training and education about fall risk and prevention strategies.
- Complete a comprehensive, performance-based home assessment. Recommend and/or provide home and activity modifications.
- Educate regarding hypothermia prevention.
- Eat well and dress warmly.
- Dry off if you get wet.
- Wear a hat and scarves and gloves when it is cold.
- Avoid alcohol before going out in the cold.

For Osteoarthritis Impairments and Functional Limitations:

- ADL, IADL, work and leisure impairment, Functional mobility impairment, Limited ROM (typically seen in shoulder abduction and external rotation, elbow extension, forearm pronation and supination wrist flexion and extension, radial ulna deviation, and thumb and finger flexion and extension).
- Impaired grip and pinch strength
- Hand deformities due to osteophyte formation in the DIP (Heberden nodes) and at the PIP (Bouchard nodes).
- Impaired strength
- Limited activity tolerance and endurance
- Joint pain, stiffness and inflammation that increase with activity
- Impaired fine motor control
- Impaired hand function
- Fall risk

Occupational Therapy Intervention:

- ADL, IADL, work and leisure training including but not limited to train in the use of adaptive equipment to improve grasp (built-ups), improve ease of performance (electric can opener), compensate for range of motion loss (dress stick), compensate for weak/absent muscle (universalcuff, jar opener), prevent stress on joints (lever door handle), prevent prolonged grasp(book holder, Dycem), prevent accidents (bath seat, nonskid rugs).
- Instruct in energy conservation strategies and joint protection.
- Instruct in activity balancing (balancing self-care, work, play and rest)
- Train in safe and efficient functional mobility (sit to stand; bed mobility skills; transfers; ambulation and wheelchair mobility) during ADL and IADL tasks.
- Provide UE, neck and trunk therapeutic activities and exercises to improve ROM and strength.
- Acute flare-ups – instruct in performing gentle range of motion exercises 3-4 times daily followed by icing for 15 minutes.
- For non-acute joints – instruct in the use of superficial heat, gentle self- stretching techniques and strengthening in pain free range.
- Instruct in home program with verbal and written instructions

Occupational Therapy Intervention:

- Provide splints to rest inflamed joints, maintain proper joint alignment, improve functional control and support weak or painful joints.
- Resting hand splint, wrist cock-up, finger splints, ulnar deviation splint, tri-point proximal interphalangeal joint splint, and thumb spica splint.
- Instruct in pain management techniques to improve participation in ADL tasks.
- Teach stress management and relaxation techniques.
- Coordinate medication peak with exercise and activity.
- Educate in use of superficial heat and cold.
- Teach self-massage techniques.

- Provide positioning support devices (back supports, pillows, and splints).
- Complete a comprehensive, performance-based home assessment. Recommend and/or provide home and activity modifications.
- Provide education about fall risk and prevention strategies.

Patient and Caregiver Handouts:

- Deep Breathing Exercise
- Energy Conservation
- Exercise Guidelines for Arthritis
- Joint Protection
- Splint/Orthosis Instructions
- Superficial Cold
- Superficial Heat
- Upper Body Active ROM Exercises

Resources:

1. Arthritis Foundation - Website
2. Arthritis Helpbook - Website
3. Arthritis Today magazine - Website

Joint Protection Principles

Joint protection principles are a series of techniques which can be included into all activities. This will reduce the stress on your joints. Joints that have been weakened by arthritis are at risk of being damaged by stress and strain. Improper use of diseased joints may lead to impaired function and deformity. Joint protection techniques are ways of doing activities so that the risk of deformity is decreased.

1. Respect For Pain

- Stop activities before you reach the point of discomfort or pain.
- Limit activities which cause your pain to last more than one hour after you have stopped the activity.

2. Balance Activity And Rest

- Rest before becoming tired.
- Plan rest periods during longer or more difficult activities.
- By resting 10 minutes during an activity, you will have more energy to continue.

3. Avoid Activities Which Cannot Be Stopped

- When you begin to feel joint pain, stop. This will eliminate excessive pain and fatigue later.
- Prioritize activities. Consider the activity, length of time, and difficulty before beginning.
- Plan difficult activities for "peak" energy times.

4. Use Larger, Stronger Joints For Activities,

- When Possible, Distributing The Weight Over Non-involved Or Stronger Joints.
- To lift a bag from a counter, bend your knees, hug the bag with both arms. Bend your elbows so that the bag is held tightly to your chest and straighten your knees. Keep hold on the bag by keeping your elbows bent. If the load is too heavy, push shopping cart, or get help with groceries - use drive-up service.
- You can use your hip to push open doors, and your feet to close lower drawers.

5. Avoid Staying In One Position For Extended Periods Of Time.

- Plan rest periods.
- Change your position.
- Stretch and relax your joints.

6. Maintain Or Use Your Joints In Good Alignment.

- Maintain proper posture.
- This is good alignment.
- Avoid or change activities that cause your fingers to move towards the little finger side of your hand.

7. Maintain Proper Weight.

- Additional weight can stress weight-bearing joints (hip, knees, feet, back).

Special Considerations For The Hands

- Avoid tight grasp.
- Avoid pressure on the back of knuckles (MP joints).
- Use both hands when possible.
- Avoid repetitive hand activities.
- Avoid pressure at the tip of thumb.

Energy Conservation with Self Care Activities

Remember to use your pursed lip breathing.

Pace yourself and rest frequently.

Eating

1. Eat slowly and completely chew your food.
2. Eat six small meals a day instead of three big meals. This will cut down on the energy you need to chew and digest your food.
3. Avoid gas-forming foods that bloat your abdomen and make it more difficult to breathe, such as peas, melons, turnips, onions, cauliflower, apples, corn, broccoli, cucumbers, cabbage, beans, and Brussels sprouts.

Grooming

1. Sit to shave, comb your hair and brush your teeth.
2. Support your elbows on the counter while grooming or shaving.
3. Use an electric toothbrush and an electric razor.
4. Wash your hair in the shower. Keep your elbows low and your chin tucked.
5. Avoid aerosols and strong scents.

Bathing and Showering

1. If your doctor has prescribed oxygen to be used during exercise, then use it when you take a shower.
2. Make certain your bathroom is well-ventilated.
3. Consider taking your shower in the evening to allow plenty of time.
4. Gather all the necessary items you will need, including your clothes.
5. Sit to undress, bathe, dry and dress. Use a bath chair in your shower.
6. Avoid over reaching. Use a long-handled brush to wash your back and feet. Use a hand-held showerhead to rinse.
7. Use a shower caddy and soap on a rope or place soap in a nylon stocking and tie the stocking to the shower seat or soap dish.
8. Have a towel or robe near by. Consider using hand towels because they are not as heavy. Avoid the task of drying by putting on a terry cloth robe.

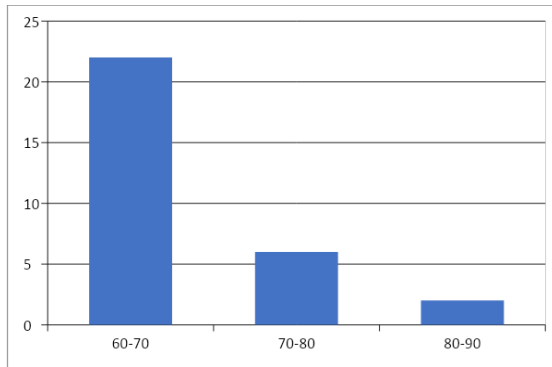
Dressing

1. Gather all the necessary items you will need.
2. Sit to dress.
3. Minimize bending by bringing your foot to the opposite knee, use a step stool or use long handled equipment to put on pants, shoes and socks.
4. Wear easy-to-put-on, comfortable clothes such as slip-on shoes; elastic waistbands and one sized larger shirts
5. Avoid restrictive clothes such as belts, ties, tight socks, girdles and bras. Use suspenders if belts are too restricting.

RESULTS**SAMPLE CHARACTERSTICS**

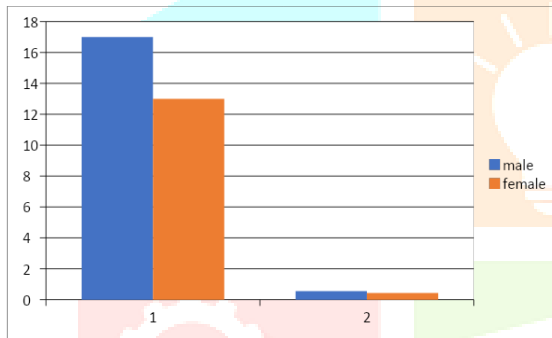
1. **Age:** Number of subjects between the age range 60-70 years were 22 , 70-80 years were 6 , and 80-90 years were 2.

Variable	Total no. of subjects	Range	Mean	Group	No. of subjects
Age	30	60-90		60-70	22
				70-80	6
				80-90	2

GRAPH-1: SHOWING DISTRIBUTION OF AGE GROUPS

2.Gender: Out of 30 subjects males were 17 and females were 13

Variable	Total no. of subjects	Male	Female
Gender	30	17	13

GRAPH-2: SHOWING DISTRIBUTION OF GENDER**Effectiveness of Occupational therapy intervention on FUNCTIONAL AUTONOMY**

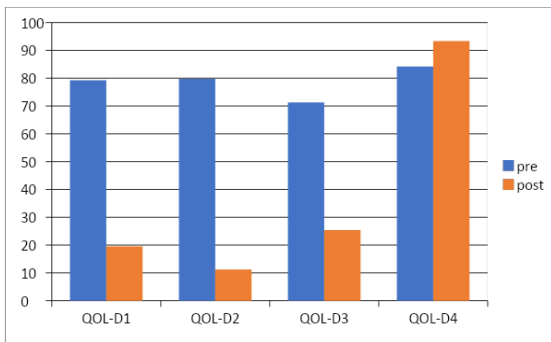
Data was analyzed by independent t test and the t value for ADL, MOBILITY, COMMUNICATION, MENTAL FUNCTIONS AND I-ADL were respectively as shown in table. Hence, experimental hypothesis is accepted also the p value coming out to be 0.0001 for 3 variables which is less than 0.005. This shows that this research is significant.

1. Comparison of FUNCTIONAL AUTONOMY, Pre and Post Occupational therapy treatment.

Variable	Mean+ SD SMAF(pre)	Mean+ SD SMAF(post)	t value	p value	significance
ADL	70.4	77.2	-5.79	0.0001	Significant
MOBILITY	12.2	14.2	-10.23	0.0001	Significant
COMMUNICATION	14.8	14.8	-0.30	0.38	Not significant
MENTAL FUNCTIONS	22.9	22.9	-0.12	0.44	Not significant
I-ADL	34.7	22.3	24.85	0.0001	Significant

2. Comparison of QUALITY OF LIFE pre and post occupational therapy intervention.

Data was analyzed by independent t test and the t value for PHYSICAL HEALTH, PSYCHOLOGICAL, SOCIAL RELATIONSHIP, ENVIRONMENT were respectively as shown in table. Hence, experimental hypothesis is accepted also the p value coming out to be 0.0001 for 3 variables which is less than 0.005. This shows that this research is significant.



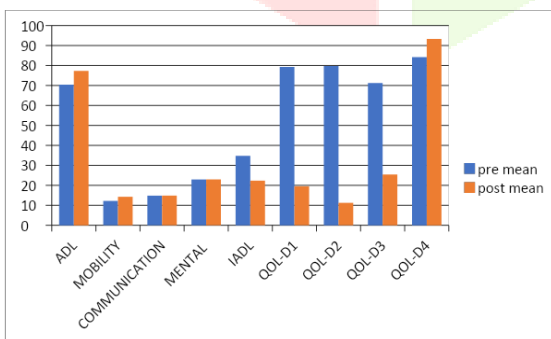
.Comparison of each variable of SMAF AND WHOQOL, pre and post treatment intervention

SMAF

	ADL	MOBILITY	COMMUNICATION	MENTAL FUNCTIONS	I-ADL
Mean Pre-test	70.4	12.2	14.8	22.9	34.7
Mean Post-test	77.2	14.2	14.8	22.9	22.3

WHOQOL

	Physical health	Psychological	Social relationships	Environment
Mean Pre-test	79.26	79.76	71.26	84.2
Mean Post-test	19.51	11.24	25.41	93.3



RESULTS SHOWED THERE WERE MARKED IMPROVEMENT IN FUNCTIONAL AUTONOMY AND QUALITY OF LIFE OF ELDERLY.

CONCLUSION

The purpose the the study was to analyse the effectiveness of Occupational Therapy Intervention on Functional Autonomy and Quality of life of Elderly having Osteoarthritis and we the results suggest that there is significant role of Occupational Therapy Intervention on elderly population having osteoarthritis. It was also seen that there was marked improvement in the functional autonomy as well as quality of life as a whole of elderly.