A COMPARATIVE STUDY OF EFFECTIVENESS OF FELDENKRAIS BREATHING EXERCISES VS CONVENTIONAL THERAPY FOR IMPROVING QUALITY OF LIFE IN CHRONIC OBSTRUCTIVE PULMONARY DISEASE PATIENTS

A Dissertation Submitted to

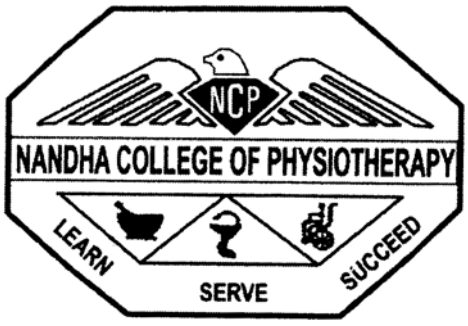
THE TAMILNADU Dr. M.G.R. MEDICAL UNIVERSITY

CHENNAI

In partial fulfillment of the requirements
for the award of the

MASTER OF PHYSIOTHERAPY DEGREE
(ADVANCED PHYSIOTHERAPY IN CARDIORESPIRATORY)

Submitted by
Reg. No. 27102008



NANDHA COLLEGE OF PHYSIOTHERAPY
ERODE – 638 052.
APRIL 2012

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The dissertation entitled

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Under the guidance of

Prof. R. SARAVANANA KUMAR M.P.T.(Cardio)

A Dissertation Submitted to

THE TAMILNADU Dr. M.G.R. MEDICAL UNIVERSITY

CHENNAI

Dissertation Evaluated on _____

Internal Examiner **External Examiner**

CERTIFICATE BY THE HEAD OF THE INSTITUTION

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This is to certify that **(Reg. No. 27102008)** is a bonafide student of **Nandha College of Physiotherapy,** studying **Master of Physiotherapy (Advanced Physiotherapy in Cardio respiratory) degree** course from the year 2010-2012. The dissertation entitled **"A COMPARATIVE STUDY OF EFFECTIVENESS OF FELDENKRAIS BREATHING EXERCISES VS CONVENTIONAL THERAPY FOR IMPROVING QUALITY OF LIFE IN CHRONIC OBSTRUCTIVE PULMONARY DISEASE PATIENTS"** is a record of original and independent work done by her under the guidance of **Prof. R. SARAVANANA KUMAR M.P.T.(Cardio)**

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Place : Erode **Signature of Guide**

Date :

DECLARATION

I hereby declare and present my project work entitled **"A COMPARATIVE STUDY OF EFFECTIVENESS OF FELDENKRAIS BREATHING EXERCISES VS CONVENTIONAL THERAPY FOR IMPROVING QUALITY OF LIFE IN CHRONIC OBSTRUCTIVE PULMONARY DISEASE PATIENTS"** is outcome of original research work was undertaken and carried out by me under the guidance of **Prof. R. SARAVANANA KUMAR M.P.T.(Cardio)**

To the best of my knowledge this dissertation has not been formed in any other basic for the award of any other degree, diploma, associateship, fellowship, previously from any other medical university.

Reg. No. 27102008

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TABLE OF CONTENTS

CHAPTERS	CONTENTS	PAGE NO.
1	**INTRODUCTION**	**1**
1.a	OPERATIONAL DEFINITIONS	**6**
1.b	NEED FOR THE STUDY	**7**
1.c	OBJECTIVE OF THE STUDY	**8**
1.d	HYPOTHESIS	**8**
2	**REVIEW OF LITERATURE**	**9**
3	**MATERIALS AND METHODOLOGY**	**17**
3.a	MATERIALS	**17**
3.b	METHODOLOGY	**17**
3.b.1	RESEARCH DESIGN	**17**
3.b.2	STUDY SETTING	**17**
3.b.3	SAMPLING METHOD	**17**
3.b.4	CRITERIA FOR SELECTION OF SAMPLES	**18**
3.b.5	STUDY DURATION	**18**
3.c	PARAMETERS	**19**
3.d	TECHNIQUES AND APPLICATION	**19**
3.e	TREATMENT PROTOCAL	**20**
3.e.1	FELDENKRAIS BREATHING EXERCISE	**20**
3.e.2	VARIABLES OF THE STUDY	**21**
3.e.3	STATISTICAL TOOLS	**21**

4	**DATA ANALYSIS AND INTERPRETATION**	**23**
5	**RESULTS AND DISCUSSION**	**28**
6	**SUMMARY AND CONCLUSION**	**30**
	BIBLIOGRAPHY	**31**
	APPENDICES	**33**

TABLES AND GRAPHS

TABLES AND GRAPHS	QOL VALUES	PAGE NO.
TABLE- 1/ GRAPH- 1	Mean difference values for QOL	**24**
TABLE- 2/ GRAPH- 2	Standard deviation values for QOL	**25**
TABLE- 3/ GRAPH- 3	Paired ‘t’ test values for QOL	**26**
TABLE- 4/ GRAPH- 4	Unpaired ‘t’ test values for QOL	**27**

INTRODUCTION

1. INTRODUCTION

Chronic obstructive pulmonary disease[1] (COPD) is a life-threatening lung disease that interferes with normal breathing and it also has a significant impact on other bodily systems. COPD is preventable, but not curable.

Treatment can help slow disease progression, but COPD generally worsens slowly over time. Because of this, it is most frequently diagnosed in people aged 40 years or older.

COPD is characterized by limitation of airflow - both into and out of the lungs - that is not fully reversible. This airflow limitation usually worsens over time and is associated with an abnormal inflammatory response of the lungs to noxious stimuli.

According to World Health Organization estimates, 64 million people have COPD worldwide in 2004 and more than 3 million people died of COPD in 2004, which is equal to 5% of all deaths globally that year. COPD kills on average one person every 10 seconds[2].

Total deaths from COPD are projected to increase by more than 30% in the next 10 years, making it the third leading cause of death in the world. Almost 90% of COPD deaths occur in low- and middle-income countries, where effective strategies for prevention and control are not always implemented or accessible.

The global scenario of diseases is shifting from infectious diseases to noncommunicable diseases, with chronic conditions such as heart disease, stroke and chronic obstructive pulmonary disease (COPD) now being the chief causes of death globally.

Feldenkrais Exercise[3]:

There are numerous ways and therapies by which breathing problems, such as COPD, can either be resolved or worsened. Some of the popular methods are yoga and pranayama, the Buteyko method, or Inspiratory Muscle Training.

The Feldenkrais method, the Alexander Technique, and natural breathing therapy are the safest.

Feldenkrais experimented by performing minute variations in his movements to become more aware of his own body mechanisms as a whole. Eventually through self experimentation and variation of movement, he overcame his disability, improved his gait, decreased his pain, enhanced his functional level, and avoided surgery. He too found that his discoveries were equally helpful to others, and after many years of teaching, he began to train others to become teachers of his method. There are well over 2000 practitioners of his method teaching throughout the world today[4].

The breadth, vitality and precision of Dr. Feldenkrais' work has seen it applied in diverse fields including neurology, psychology, performing arts, sports and rehabilitation.

The Feldenkrais Method involves deliberate small gentle movements that retrains the body to move in different ways. The Feldenkrais Method combines the techniques of massage, healing touch, breath work, and body alignment with psychological awareness and movement training sessions.

The Feldenkrais method aims to improve movement repertoire, aiming to expand and refine the use of the self through awareness, in order to reduce pain or limitations in movement, and promote general well-being[5].

The Feldenkrais Method is often regarded as falling within the field of integrative medicine or complementary medicine; however, in Sweden the method is practised within the normal healthcare system usually by physiotherapists[6].

Benefits of Feldenkrais Method:

- Improves posture
- Reduces pain
- Relaxes stressed and tense muscles
- Increases mental awareness
- Increases mobility
- Improves flexibility and coordination
- Releases restrictive and blocked patterns

With Feldenkrais, there are two approaches:

1. Awareness Through Movement® (ATM)[7]- Group classes & led by a teacher:

These classes increase mobility and help replace old patterns of movement with new, improving breathing and blood circulation. Patients engage in precisely structured movement explorations that involve thinking, sensing, moving, and imagining. Each lesson consists of comfortable, easy movements that gradually evolve into movements of greater range and complexity.

ATM lessons attempt to make one aware of his/her habitual neuromuscular patterns and rigidities and to expand options for choosing new ways of moving while increasing sensitivity and improving efficiency. There are hundreds of Awareness Through Movement lessons contained in the Feldenkrais Method that vary, for all levels of movement ability, from simple in structure and physical demand to more difficult lessons.

Feldenkrais taught that changes in our ability to move are inseparable from changes in our conscious perception of ourselves as embodied. He said that changes in the physical experience could be described as changes in our internal self image, which can be conceived as the mapping of the motor cortex to the body. (This relates to the body image theory that was developed by Penfield in the form of cortical homunculus.) Feldenkrais felt that activity in the motor cortex played a key role in proprioception (the sense of body position). He aimed to clarify and work therapeutically with

this relationship, with instructions that involved both specific movement instructions and invitations to introspection.

2. Functional Integration® (FI)[8]- Individual sessions:

One-to-one sessions, using touch and tissue manipulation, where the practitioner actively directs the client's body who may be sitting, lying or standing (fully clothed) through various movements tailored to individual needs.

The practitioner uses this "hands-on" technique to help the student experience the connections among various parts of the body (with or without movement). Through precision of touch and movement, the client learns how to eliminate excess effort and thus move more freely and easily. Lessons may be specific in addressing particular issues brought by the client, or can be more global in scope. Although the technique does not specifically aim to eliminate pain or "cure" physical complaints, such issues may inform the lesson. Issues such as chronic muscle pain may resolve themselves as the client may learn a more relaxed approach to his or her physical experience—a more integrated, free, and easy way to move.

What the Feldenkrais Method is not,

- The Method is not a medical, massage, bodywork, or therapeutic technique. The Method is a learning process

- The Feldenkrais Practitioner has no sexual intent and does not touch the sexual or other intimate parts of a person

- Chemical or mechanical aids are not used in the practice of the Feldenkrais Method

1.a. OPERATIONAL DEFINITIONS

Chronic obstructive pulmonary disease (COPD) - Functional definition[9]:

Preventable and treatable disease state characterized by airflow limitation that is not fully reversible. The airflow limitation is usually progressive and associated with an abnormal inflammatory response of the lungs in response to noxious agents including cigarette smoke, biomass fuels and occupational agents. The chronic airflow limitation characteristic of COPD is caused by a mixture of small airway disease (obstructive bronchiolitis) and parenchymal destruction (emphysema). COPD is a multicomponent disease with extra-pulmonary effects.

Feldenkrais Method[10]:

The Feldenkrais Method is a body-centered learning process that uses gentle, guided movements in order to stimulate the brain to reorder the neuro-motor functions of the body. This may improve posture, flexibility, and coordination, as well as aiding in the release of chronic tension. This system combines stretching, exercise and yoga to to help people to become more aware of movement patterns and to encourage proper body movement.

Pupils are taught to become aware of their movements and to become aware of how they use their bodies, thus discovering possible areas of stress and strain. The goal of Feldenkrais is to take the individual from merely functioning, to functioning well, free of pain and restriction of movement. Feldenkrais himself stated that his goal was, "To make the impossible possible, the possible easy, and the easy, elegant."

There are more than 1000 Awareness Through Movement lessons (designed by the Feldenkrais Method).

KATZ AND LAWTON'S QUALITY OF LIFE QUISTIONAIRE

It was developed to measure the problems that adults with COPD experience in their day-to-day life and it contains 20 questions which is subdivide into 4 groups as basic, instrumental, optional instrumental & related articles.

1.b. NEED FOR THE STUDY

The numbers of COPD patients are projected to increase by more than 30% in the next 10 years, globally. Almost 90% of COPD deaths occur in low- and middle-income countries, where effective strategies for prevention and control are not always implemented or accessible and COPD patients also have a poorer quality of life, greater limitation of daily activities and a faster progression of their disease.

1.c. OBJECTIVE OF THE STUDY

- To evaluate the effectiveness of Feldenkrais Technique for COPD patients
- To find out whether the quality of life improves in COPD patients with treatment technique

1.d. HYPOTHESIS

NULL HYPOTHESIS

There is no significant difference in the effects of Feldenkrais breathing exercises for improving quality of life in chronic obstructive pulmonary disease patients

ALTERNATE HYPOTHESIS

There is a significant difference in the effects of Feldenkrais breathing exercises for improving quality of life in chronic obstructive pulmonary disease patients

REVIEW OF LITERATURE

2. REVIEW OF LITERATURE

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treatment methods used have not been scientifically evaluated. The purpose of this study is to compare treatment effects of Body Awareness Therapy, Feldenkrais, and conventional individual treatment with respect to changes in psychological distress, pain, and self-image in patients with nonspecific musculoskeletal disorders.

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- **Shenkman, M., Donovan, J., Tsubota, J., Kluss, M., Stebbins, P., & Butler, R., 1989. Physical Therapy, 69, 944-955.** Management of individuals with Parkinsons disease: Rationale and case studies. Mentions Feldenkrais Method as treatment option

- **Gutman, G. Herbert, C. Brown, 1977. Journal of Gerontoloy, 32(5), 562-572.** Feldenkrais vs Conventional Exercise for the Elderly. Measurements included height, weight, blood pressure, heart rate,

balance, flexibility, morale, self-perceived health status and level of performance of activities of daily living, also the number of body parts difficult to move or giving rise to pain

- **Sanjiv Jain, MD, Kristy Janssen, PA-C, Sharon DeCelle, MS, PT, CFT. Physical Medicine & Rehabilitation Clinics of North America.** Alexander technique and Feldenkrais method: a critical overview: Compares the Feldenkrais method with the conventional therapies & states that this technique provide tools to improve functional quality of movement and improve quality of life

MATERIALS AND METHODOLOGY

3. MATERIALS AND METHODOLOGY

3.a. MATERIALS

- Treatment couch
- Pillows
- Chair
- Assessment chart

3.b. METHODOLOGY

3.b.1. RESEARCH DESIGN

The design that is used for this study is the quasi experimental design[11].

3.b.2. STUDY SETTING

The entitled study was conducted at

- Out patient department of Nandha college of physiotherapy, Erode
- Danvanthri Critical Care Center, Erode
- Government Head Quarters Hospitals, Erode

3.b.3. SAMPLING METHOD[12]

The subject was selected based upon the purposive random sampling technique, sample of 30 COPD patients were taken into the study who were randomized into the experimental group (15 COPD patients) and control group (15 stroke patients).

3.b.4. CRITERIA FOR SELECTION OF SAMPLES

Inclusive criteria

- Both male and female
- Age group 40-60 years
- Based on assessment and diagnosed as mild, moderate and severe COPD patients

Exclusive criteria

- Severe exaggerated COPD patients
- Patients with cardiological problems
- Patients with neurological and orthopedic problems
- Patients with visual and auditory disorder
- Mentally retarded patients
- Arterial disease
- Deep vein thrombosis
- Infective conditions
- Pregnancy
- Pace-maker

3.b.5. STUDY DURATION

The study was carried out for a period of 4 months of duration and each patient was trained according to which group he /she belongs in this study.

Experimental group

It consists of 15 patients who underwent Feldenkrais and breathing, relaxation exercise.

Control group

It consists of 15 patients who underwent only breathing, relaxation exercise.

3.c. PARAMETERS

KATZ AND LAWTON’S QUALITY OF LIFE QUISTIONAIRE

3.d. TECHNIQUES AND APPLICATION

A total 30 subjects were selected based on the inclusive criteria. A brief explanation and demonstration about Feldenkrais exercises were given to the selected subjects.

Before starting the treatment program, general cardio respiratory assessment was taken for all the patients. In addition, COPD quality of life scale was also measured for all the patients. Instructions were given to the patients about the treatment program. A regular periodical assessment was taken for all the subjects at every weekend and after completion of eight weeks. Finally, post treatment COPD quality of life scale was measured and documented.

3.e. TREATMENT PROTOCAL

3.e.1. FELDENKRAIS BREATHING EXERCISE

- Teach awareness of all the major parts of the breathing system, such as the nostrils, throat, wind pipe, bronchial tube, lungs, diaphragm, intercostals muscles, abdominal muscles and ribs
- Teach how breathing is related to movement and posture
- Break bad habits thru unusual movements like expanding the rib cage during exhalation

    - 3 minutes slow breathing – costal, diaphragmatic breathing
    - Breath for 10 – 15 seconds
    - Repeat 3 – 5 times
    - Exercise sessions lasting 20 – 30 minutes
    - At least 3 – 4 times a week

Outcome measures

The symptoms were measured by COPD quality of scale before the commencement of treatment technique which was taken as pre-treatment values.

Intermediate measurements were also taken at various points of time, to monitor the progress.

The post-treatment values were measured after the final treatment session.

3.e.1 VARIABLES OF THE STUDY

Independent variable: Feldenkrais exercise

Dependent variable: Quality of life

3.e.2 STATISCAL TOOLS

Then statistical tests were performed by using the following formula[12]

Mean $X = \sum \bar{X} / n$

x- Sum of observation

n- Number of observation

To compare the effects between two groups students 't' test for paired values.

$$t = \frac{\bar{d}}{s} x \sqrt{n}$$

d- Mean difference (M.D)

S- Standard deviation (S.D)

n- Number of observation

To compare the effects between two groups, students 't' test for unpaired values

$$t = \left[t = \frac{\bar{X}_1 - \bar{X}_2}{s\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}} \right]$$

$$S = \sqrt{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2} \Big/ n_1 + n_2 - 2$$

$\bar{X}_1$ - M.D of group A

$\bar{X}_2$ - M.D of group B

S_1 - SD of group A

S_2 - SD of group B

n_1 - Number of observations in group A

n_2 - Number of observations in group B

DATA ANALYSIS & INTERPRETATION

4. DATA ANALYSIS AND INTERPRETATION

For the pre and post test experimental study, both paired and unpaired ‘t’ test was used for each parameter in an intra group analysis to find out the significance of improvement achieved through intervention. Then unpaired ‘t’ test was used to find out the significance of the changes between two groups i.e., inter-group analysis.

TABLE- 1

Mean difference value for COPD patients of experimental group and control group

Groups	Mean difference
Experimental group	1.7
Control group	0.6

GRAPH- 1

Graphical representation of mean difference value for COPD patients of experimental group and control group

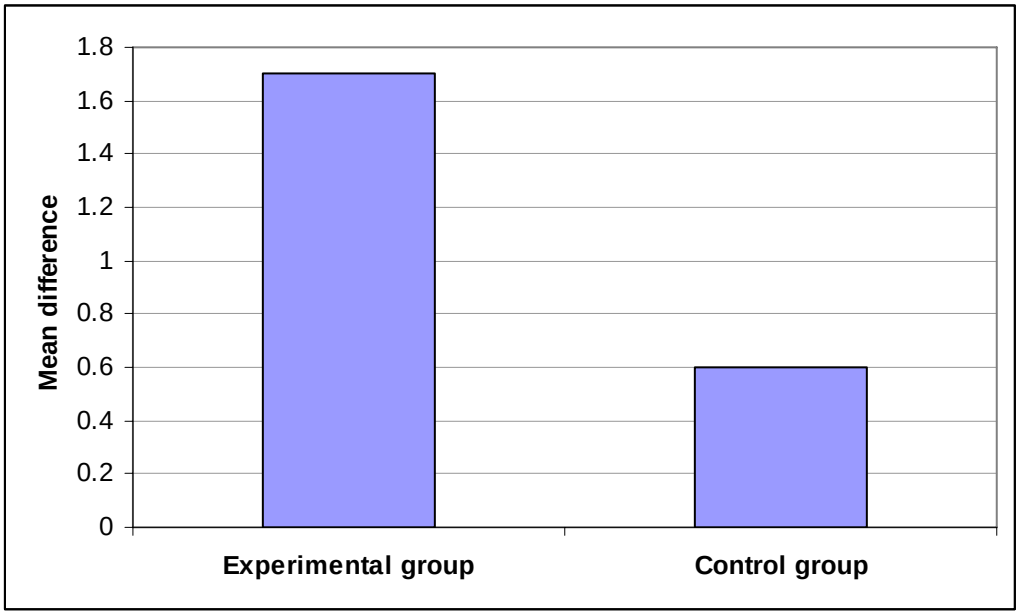


TABLE- 2

Standard deviation values for COPD patients of experimental group and control group

Groups	Standard deviation
Experimental group	0.8
Control group	0.6

GRAPH- 2

Graphical representation of standard deviation value for COPD patients of experimental group and control group

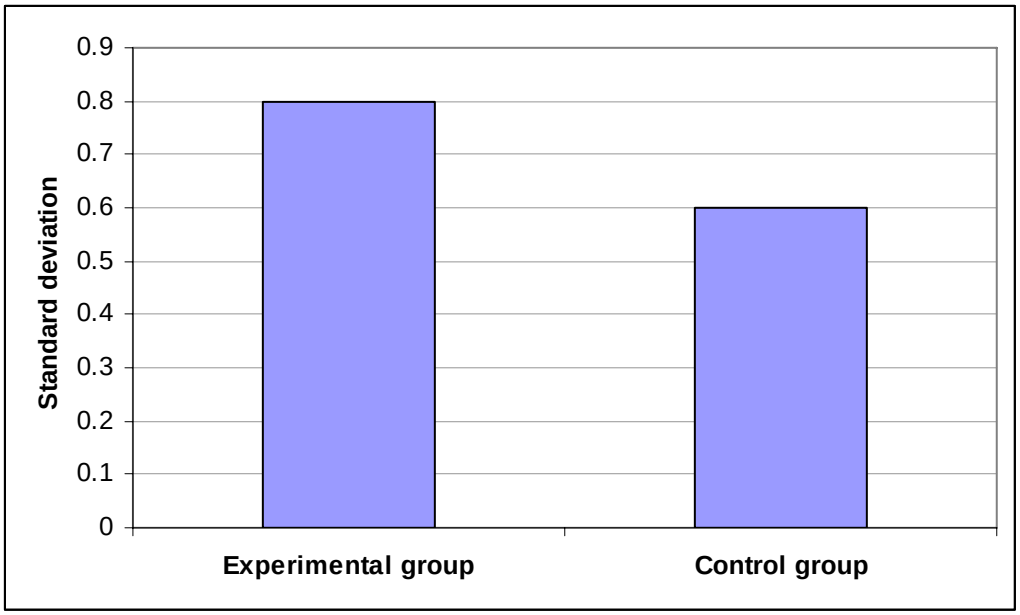


TABLE- 3

Paired ‘t’ test values for COPD patients of experimental group and control group

Groups	Calculated value	Table value[13]	Significance
Experimental group	8.2	2.15	Significant
Control group	3.7	2.15	Significant

GRAPH- 3

Graphical representation of paired ‘t’ test value for COPD patients of experimental group and control group

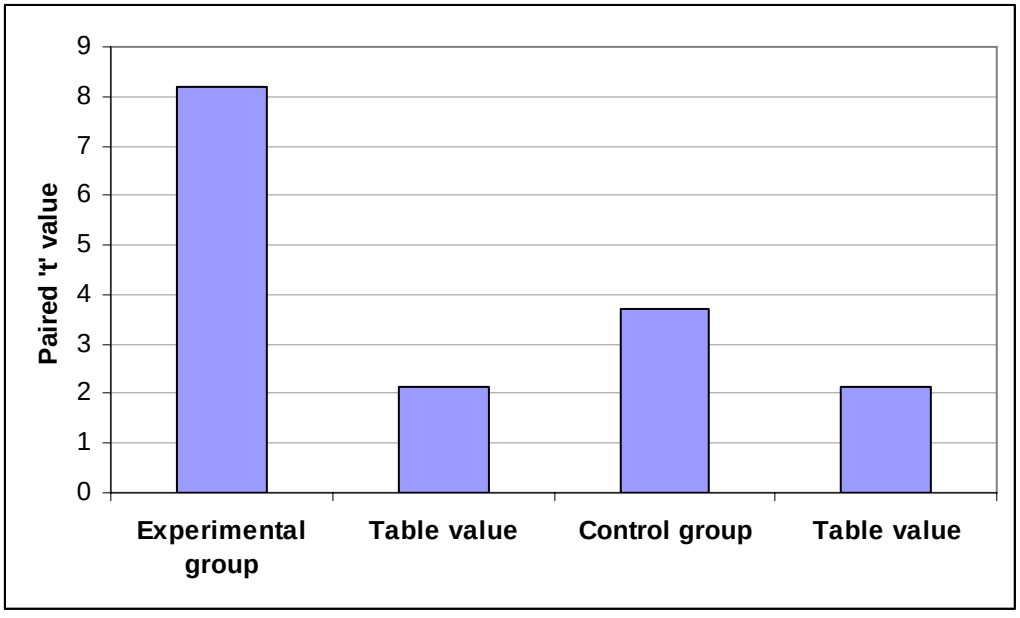


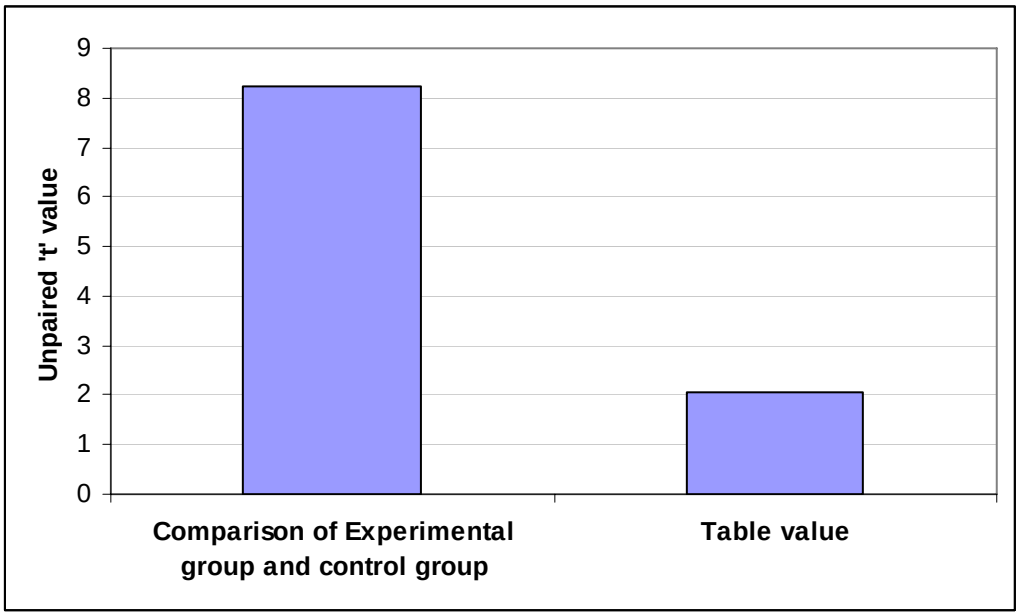
TABLE- 4

Unpaired ‘t’ test values for COPD patients of experimental group and control group

Groups	Calculated value	Table value	Significance
Comparison of Experimental group and control group	8.25	2.05	Significant

GRAPH- 4

Graphical representation of unpaired ‘t’ test value for COPD patients of experimental group and control group



RESULTS AND DISCUSSION

5. RESULTS AND DISCUSSION

The study was conducted to find out whether Feldenkrais exercise improves the quality of life in COPD patients. 30 patients were treated by this method and the test results were analyzed by using quasi experimental method.

The pre and post test values were assessed in the experimental group. The standard deviation and the 't' value were calculated by paired 't' test and the values were 0.8 and 8.2 respectively. These values were higher than the table value 2.15 with 5% level of significance at 14 degrees of freedom.

The pre and post test values were assessed in control group. The standard deviation and the 't' value were calculated by paired 't' test and the values were 0.6 and 3.7 respectively. These values were higher than the table value 2.15 with 5% level of significance at 14 degrees of freedom.

The calculated 't' values by unpaired 't' test was 8.25 which was higher than the table value 2.05 with 5% level of significance at 28 degrees of freedom.

The paired 't' test values have shown that Feldenkrais exercises were more effective than conventional therapy on COPD Patients.

Stephens, James, Pendergast, Christopher, Roller, Beth Ann, & Weiskittel, Robert Scott, 2005 study has proved that Feldenkrais breathing exercise is effective and improves quality of life in COPD patients and it is evaluated by Katz and Lawton's quality of life questionnaire.

IFF Academy Feldenkrais Research Journal, 2.

From: http://www.iffresearchjournal.org/stephens2005.htm.

Limitation of study:

This study was conducted on small size sample only.

Duration of involvement was also Explored, theorizing that subject with more chronic involvement may not respond as well as their shorter duration counterparts.

How well a subject attened the treatment, exercised, or adhered to their home program might influence the results of this study. The effect of the following factors like time of testing; climatic conditions, psychological factors, nutrition regular activities of daily living could not be controlled during the testing period.

Recommendation:

A similar study may be extended with larger sample size.

Feldenkrais exercise techniques may be applied to the other conditions such as, Cerebral palsy, Arthritis, Fibromyalia, Chronic pain, etc

SUMMARY AND CONCLUSION

6. SUMMARY AND CONCLUSION

Based on 't' values, it could be seen that there is significant difference between the calculated values and table values.

The mean and standard deviation value of experimental group is higher than the control group.

Through the results, the null hypothesis is rejected and alternate hypothesis is accepted.

So, we conclude that Feldenkrais breathing exercise therapy is more effective for improving quality of life in chronic obstructive pulmonary patients.

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APPENDICES

APPENDIX- I

CARDIO-PULMONARY ASSESMENT

SUBJECTIVE EXAMINATION

Name: OP No.:

Age: Date:

Gender:

Occupation:

Chief complaints

Shortness of breath

Cough

Wheeze

Chest pain

Sputum

Dizziness

Past medical history

Associated problems

Present medical history

Personal history

Allergic irritants:

Smoking: Duration: No. of cigarettes/day:

Alcohol:

Diet:

Other habits:

OBJECTIVE ASSESMENT

On observation:

Built:

Posture:

Use of accessory muscles:

Chest wall deformities:

Restlessness:

Sputum:

Quantity:

Colour:

Consistency:

Cough:

Type:

Frequency:

On palpation

Tracheal descent:

Thoracic expansion:

On examination

Auscultation:

Breathe sound:

Added sound:

Heart sound:

Peripheral pulse:

Percussion note:

Vocal fremitus:

Activities of daily living

Assessment of quality of life

APPENDIX- II

KATZ AND LAWTON'S ADL SCALE FOR MEASURING QUALITY OF LIFE

Personal hygiene

None of the time	Some of the time	Most of the time	All the time
1	2	3	4

Dressing

None of the time	Some of the time	Most of the time	All the time
1	2	3	4

Feeding

None of the time	Some of the time	Most of the time	All the time
1	2	3	4

Voluntary urine control

None of the time	Some of the time	Most of the time	All the time
1	2	3	4

Voluntary bowel control

None of the time	Some of the time	Most of the time	All the time
1	2	3	4

Ambulation

None of the time	Some of the time	Most of the time	All the time
1	2	3	4

Ability to use telephone

None of the time	Some of the time	Most of the time	All the time
1	2	3	4

House work

None of the time	Some of the time	Most of the time	All the time
1	2	3	4

Meal preparation

None of the time	Some of the time	Most of the time	All the time
1	2	3	4

Shopping

None of the time	Some of the time	Most of the time	All the time
1	2	3	4

Laundering

None of the time	Some of the time	Most of the time	All the time
1	2	3	4

Mode of transportation

None of the time	Some of the time	Most of the time	All the time
1	2	3	4

Responsibilities of own medicines

None of the time	Some of the time	Most of the time	All the time
1	2	3	4

Ability to handle finance

None of the time	Some of the time	Most of the time	All the time
1	2	3	4

Care (of self, children, elder)

None of the time	Some of the time	Most of the time	All the time
1	2	3	4

Emergency response

None of the time	Some of the time	Most of the time	All the time
1	2	3	4

Safety procedures

None of the time	Some of the time	Most of the time	All the time
1	2	3	4

Driving

None of the time	Some of the time	Most of the time	All the time
1	2	3	4

Personal care assistance

None of the time	Some of the time	Most of the time	All the time
1	2	3	4

Care of residence

None of the time	Some of the time	Most of the time	All the time
1	2	3	4

APPENDIX- III

FELDENKRAIS BREATHING EXERCISE

STEP 1: Lying on the floor (crook lying position), keep one hand on chest and other hand on abdomen. Do costal and abdominal breathing.

STEP 2: Crook lying, keep both hands behind the head. During neck flexion take deep breathe-in and during neck extension breathe-out. Do both costal and abdominal breathe.

STEP 3: Lying with hip and knee 90º flexion, Do costal and abdominal breathing.

STEP 4: Crook lying, one leg over the other leg. Do costal and abdominal breathing.

STEP 5: Lying with both hip abduction and knee 90º flexion. Do costal and abdominal breathing.

STEP 6: Kneel sitting. Do costal and abdominal breathing.

STEP 7: Four limb standing. Do costal and abdominal breathing.

STEP 8: Sitting with both hip abduction. Do costal and abdominal breathing.

STEP 9: Standing. Do costal and abdominal breathe.

STEP 10: Walking. Do costal and abdominal breathe.

APPENDIX- IV

MASTER TABLE

CONVENTIONAL THERAPY

Patient serial no.	Pre-test (X_1)	Pre-test (X_2)
1	3	3
2	3	2
3	4	3
4	3	2
5	2	2
6	3	3
7	3	2
8	3	3
9	3	4
10	3	3
11	3	3
12	4	4
13	4	3
14	4	2
15	3	3

Feldenkrais breathing exercise

Patient serial no.	Pre-test (X_1)	Pre-test (X_2)
1	4	2
2	3	1
3	3	1
4	4	2
5	4	2
6	3	1
7	4	1
8	4	1
9	3	2
10	4	3
11	3	2
12	3	1
13	4	2
14	2	2
15	2	1

APPENDIX- V

INFORMED CONSENT

This is to certify that I, _____ totally agree to be a subject for the project work **"A COMPARATIVE STUDY OF EFFECTIVENESS OF FELDENKRAIS BREATHING EXERCISES VS CONVENTIONAL THERAPY FOR IMPROVING QUALITY OF LIFE IN CHRONIC OBSTRUCTIVE PULMONARY DISEASE PATIENTS"** and I assure that I will not initiate or undergo any other treatment or concurrent exercise program during the course of this study.

I own all the responsibilities of my health condition, if any untoward development happened during the courses of this study.

Date: **Signature of the patient**

Date: **Signature of the candidate**