Journal of Positive School Psychology http://journalppw.com
2022, Vol. 6, No. 2, 2291 – 2308

Effectiveness of Mindfulness Based Stress Reduction Therapy (MBSRT) on Anxiety and depression, Quality of Life and Mindfulness in Diabetic Frozen Shoulder Conditions.

Niraj Kumar[1], Navneet Badoni[2*], Siddhartha Sen[3], Anirban Patra[4], Sobhit Garg[5], Kanchan Joshi[6]

[1]Ph.D. Scholar Physiotherapy (Orthopaedic) Shri Guru Ram Rai University
[2]Professor Orthopaedics, Shri Guru Ram Rai Institute of Medical & Health Sciences
[3]Associate Professor, Faculty of Physiotherapy SGT University, Gurugram, Haryana, India
[4]Shri Guru Ram Rai Institute of Medical & Health Sciences
Sobhit Garg[5], [5]HOD Psychiatry department, Shri Guru Ram Rai Institute of Medical & Health Sciences
[6]Dean Yoga department Shri Guru Ram Rai University

ABSTRACT

Introduction: The term "frozen shoulder" was first introduced by Codman in 1934. He described a painful shoulder condition of insidious onset that was associated with stiffness and difficulty sleeping on the affected side. Codman also identified the marked reduction in forward elevation and external rotation that are the hallmarks of the disease (Richard Dias et al, 2005).

Aims and Objectives: To evaluate the effectiveness of Mindfulness Based Stress Reduction Therapy (MBSRT) on Anxiety and depression, Quality of Life and Mindfulness in Diabetic Frozen Shoulder Conditions.

Methodology: 31 Patients were treated with Mindfulness Based Stress Reduction Therapy (MBSRT), Stabilization Exercise and Moist Heat Therapy. All the patients were selected after informed consent. These patients were interviewed by direct method. The patients were assessed in 0 (zero) week and reassessed in 4 (four) weeks and 8 (eight) weeks of treatment programme. Every 0 week 4 weeks and 8 weeks of treatment programme, Anxiety and depression, Quality of Life and Mindfulness were recorded.

Conclusion. Our study concluded that Mindfulness Based Stress Reduction Therapy (MBSRT), Stabilization Exercise and Moist Heat Therapy (MHT) in Patients with Diabetic Frozen Shoulder showed significant improvement in Anxiety and depression, Quality of Life and in Mindfulness in 4th weeks & 8th weeks of treatment programme.

Key Words: Diabetic Frozen Shoulder, Mindfulness Based Stress Reduction Therapy (MBSRT), Stabilization Exercise, Moist Heat Therapy.

INTRODUCTION

Diabetic frozen shoulder is characterized by pain and severe limited active and passive range of motion of the glenohumeral joint, particularly external rotation. Diabetes is frozen shoulder is due to the effects on collagen in the shoulder, which holds the bones together in a joint. Collagen gets triggered by the presence of high blood sugars. Interestingly, collagen gets sticky when sugar molecules become attached, leading to restricted movements and shoulder starting to stiffen (Cintia Garcilazo, et al. 2010).

The prevalence of adhesive capsulitis in patients with diabetes in India was reported to be 11% - 29.61 %, in Saudia Arabia 6.7%, in Iran 13.30%, in Finland 14%, in UK around 10.8%. Whereas other studies identified around 20% Australians, 38.6% Americans, 27% Indians and around 40% British reported diabetes in patients with adhesive capsulitis (Rita Rastogi, et al. 2014).

The aetiology of periarthritis of the shoulder, however, is not clearly understood. Amongst the factors suggested are trauma myocardial infarction hemiplegia, pulmonary tuberculosis, thyrotoxicosis, cerebral tumour, and epilepsy. In this paper, an association of periarthritis of the shoulder with diabetes mellitus is described. The incidence of this condition in diabetic patients is compared with that in non-diabetic medical patients seen during the same period of time (G. C. Lloyd-Roberts, et al. 1959; J. F. Bridgman, et al. 1972).

The patho-physiology of idiopathic adhesive capsulitis is poorly understood. Most authors have reported various degrees of inflammatory changes in the synovial membrane. Adhesions between the shoulder capsule and the humeral head have been noted by some, but not all, authors. The optimum management of adhesive capsulitis has been the subject of great debate, particularly since the condition tends to resolve spontaneously over months to years (Simon Carette, et al. 2003).

Jon Kabat-Zinn is considered the founding father of mindfulness-based stress reduction (MBSR), as he created the practice in the 1970s. He took a modern, scientific-based perspective to traditional Buddhist principles of mindfulness and meditation and developed a flexible approach to reducing stress. MBSR was first put into practice at the Stress Reduction Clinic at the University of Massachusetts Medical School, where Jon Kabat-Zinn was established as a professor of medicine (Courtney E. Ackerman, 2020).

Mindfulness-Based Stress Reduction (MBSR), a standardized form of meditation and yoga. Briefly, MBSR has been shown to be effective in reducing anxiety, depression, and stress in patients with chronic pain (Cecile A. Lengacher et al, 2009).

HADS is a 14-item self-report screening scale that was originally developed to indicate the possible presence of anxiety and depression states in the setting of a medical non psychiatric outpatient clinic. HADS consists of a 7-item anxiety subscale and a 7-item depression subscale. Each item scores on a 4-point Likert scale (e.g., as much as I always do [0]; not quite so much [1]; definitely not so much [2]; and not at all [3]), giving maximum subscale scores of 21 for depression and anxiety, respectively. The questionnaire assesses symptoms over the preceding week (M.J. Herreroa et al, 2003).

The WHOQOL – BREF developed by WHO (1996), is a shorter version of WHOQOL-100 comprising of 26 items. The scale provides a measure of an individual's perception of quality of life for the 4 domains: (1) Physical health - 7 items (2) Psychological - 6 items (3) Social relationships - 3 items and (4). Environment - 8 items. There are also two items that are examined separately: question 1 asks aboutan individual's overall perception of quality of life and question 2 asks about an individual's overallperception of their health. The internal consistency of WHOQOL – BREF as determined by Chronbach's alpha co-efficient ranges from 0.66-0.87. The scale is found to have good discriminate validity. It is having with good to excellent psychometric properties of reliability and validity. Higher values indicate better QOL. (WHOQOL Group, 1998 & Skevington et al., 2004).

This questionnaire consists of 39 items that assess five facets of mindfulness (FFMQ). Items are rated on a Lickert scale ranging from 1 (never or very rarely true) to 5 (very often or always true). The factors include: Observing, including noticing or attending to internal and external experiences such as sensations, thoughts, or emotions. Describing refers to labelling internal experiences with words. Acting with awareness includes focusing on one's activities in the moment as opposed to behaving mechanically. Non-judging of inner experience refers to taking a non-evaluative stance toward thoughts and feelings. Finally, non-reactivity to inner experience is allowing thoughts and feelings to come and go, without getting caught up in or carried away by them. This scale includes nine items organized in one category, and was developed for measuring acceptance and avoidance. Items are rated on a Lickert scale ranging from 1 (never true) to 7 (always true). A version validated in the Spanish population was used(A. Cebolla, et al. 2012).

AIMS AND OBJECTIVES

To evaluate the effectiveness of Mindfulness Based Stress Reduction Therapy (MBSRT) along with conventional on Anxiety and depression, Quality of Life and Mindfulness in Diabetic Frozen Shoulder Conditions.

NEED FOR THE PRESENT STUDY

Mindfulness Based Stress Reduction Therapy (MBSRT) treatment is a common treatment option for shoulder conditions. Many researchers have been done on the most common shoulder pain and stiffness, but the effectiveness of Mindfulness Based Stress Reduction Therapy (MBSRT), Stabilization exercise and Moist Heat Therapy on Anxiety and depression, Quality of Life and Mindfulness in Diabetic Frozen Shoulder Conditions are not done before so the need for study are arises.

HYPOTHESIS

Alternate Hypothesis

There will be significant differences of Mindfulness Based Stress Reduction Therapy (MBSRT) along with conventional therapy on Anxiety and depression, Quality of Life and Mindfulness in Diabetic Frozen Shoulder Conditions.

Null Hypothesis

There will be not significant differences of Mindfulness Based Stress Reduction Therapy (MBSRT) along with conventional therapy on Anxiety and depression, Quality of Life and Mindfulness in Diabetic Frozen Shoulder Conditions.

METHODOLOGY

Approval from the Synopsis Approval Committee (SAC) of SGRR University and Institutional Ethics Committee of Shri Guru Ram Rai Institute of Medical &Health Sciences, Patel Nagar, Dehradun was sought. The confidence level – 95% and confidence interval - 5% used to calculate sample size. In this study, Dehradun census (Uttarakhand) population (679,370 in 2018) was included (Census and Sample Survey, Dehradun 2018) (C. R. Kothari, 2004; Census and Sample Survey, Dehradun 2018).

In this study simple random sampling technique was used. Convenience samples were assigned to two groups' i.e. experimental group & control group. These subjects were solicited from the Shri Mahant Indiresh Hospital, Department of Physiotherapy, Patel Nagar, Dehradun (Uttarakhand) and selected according to inclusion and exclusion criteria. Inclusion Criteria:- Patients which were diagnosed to suffer from Diabetic Frozen Shoulder, Patients with limited Range of motion of shoulder abduction, external rotation and flexion, All the patients (both males and females) between ages 40 to 70 years, All the subjects must have frozen shoulder for at least last 15 days, Affected shoulder must have not more than 90 degrees of flexion & abduction and 50% decreased external rotation& internal rotation as compared to normal side/normal ROM values. Exclusion Criteria- Subjects with Rotator cuff tears and other shoulder ligament injuries, History of any arthritis related to shoulder, RA shoulder secondary to fracture, dislocation, Reflex sympathetic dystrophy and neurological disorder, Malignancy, All the patients having any cervical or thoracic problem. If present must be treated first before including in the study, All the objects having any intra articular injection in the glenohumeral joint during last three months, Patients with fractured scapula, Any history of surgery on that shoulder and patients with tendon calcification, Patients with cervical rib, Diagnosed severely osteoporotic, Diagnosed Rheumatoid Arthritis, Diagnosed Osteoarthritis, Prolonged immobilization and Neurological / Hemiplegics. Outcome Measures-HADS, FFMQ and WHOQOL [Table 1:].

OUTCOME MEASURES	S. NO.	VARIABLES	MEASUREMENTS
Outcome measures	1.	ANXITY AND DEPRESSION	HOSPITAL ANXIETY AND DEPRESSION SCALE (HADS)
	2.	MINDFULNESS	FIVE FACET OF MINDFULNESS QUESTIONNAIRE (FFMQ)
	3.	QUALITY OF LIFE (QOL)	WORLD HEALTH ORGANIZATION QUALITY OF LIFE ASSESSMENT (WHOQOL)

Table 1: Outcome Measures

PROCEDURE

All the patients were selected after informed consent. These patients were interviewed by direct method. The patients were assessed in 0 (zero) week and reassessed in 4 (four) weeks and 8 (eight) weeks of treatment programme. Every 0 week 4 weeks and 8 weeks of treatment programme with weekly 2 to 2.5 hour sessions and an additional 6-hour session in the 6th week and anxiety and depression, mindfulness and quality of life were recorded. These treatment protocols will be given five days per week for eight weeks. 31 Patients were treated with MBSR, Stabilization Exercise and Moist Heat Therapy.

Mindfulness Based Stress Reduction (MBSR):

Mindfulness Based Stress Reduction (MBSR):

The Mindfulness-Based Stress Reduction (MBSR) program, which is a clinical program to facilitate adaptation to medical illness. Mindfulness Based Stress Reduction (MBSR) would be 8-week programs with weekly 2 to 2.5 hour sessions and an additional 6-hour session in the 6th week. Daily homework of 45 minutes and instruction in three formal techniques: mindfulness meditation, Hatha yoga,Basic breath awareness practice and Mindful movement practices (shoulder stretching) recommended 6 days a week (Holger Cramer, et al. 2012).

1. Mindfulness Meditation

2. Hatha Yoga

3. Basic breath awareness practice

4. Mindful movement practices (shoulder stretching)

1. Mindfulness Meditation

Position –

Mindfulness Meditation practiced in sitting. The spine should be upright and relaxed and the shoulders should be relaxed, and slightly rolled back and down. The patient's hands should be supported, both resting on your lap so that your arms are relaxed and head should be balanced evenly, with your chin slightly tucked in. (Wildmind, 2007).

Procedure.

- Gently close your eyes and direct your focus inward.
- Notice the thoughts that emerge in your mind with openness, acceptance, and curiosity.
- Try to avoid judging any aspects of your experience and simply allow it to be just as it is.
- Notice any emotions that you may be experiencing – relate to them with kindness and compassion.
- Observe your bodily sensations with the same mindful attitude.

DURATION

As much as possible, allow yourself to fully open up to the reality of your experience for a few minutes [Figure:-1].

When we meditate, we take responsibility for our mental states and learn to alter our reactions to the experiences we have in order to produce more positive outcomes (Wildmind, 2007).

Figure:-1: Mindfulness Meditation in sitting position

2. Hatha Yoga

Haṭha yoga is a branch of yoga. The word Haṭha literally means "force" and thus alludes to a system of physical techniques.

I. Utkatasana

This pose is a “chair pose” exercise and itis intense posture or powerful posture that increase the range of motion of shoulder and strengthening the shoulder.

Position –practiced in Standing, heels together, big toes touching and heels slightly apart.

Procedure-

- Inhale, squat, bend your knees with your knees over your feet and go into half standing and half sitting position.
- Bring your torso and arms slightly of the vertical and lean slightly forward, and suck the lower belly in and up to support your lower back.
- Draw your shoulder blades gently toward each other and down.
- Soften your shoulders away from your ears.
- Lengthen through your tailbone and in that way your lower back to stay long.

Hold the pose for five breaths then release[Figure:-2].

Figure:-2:Utkatasana “chair pose” exercise

II. Gomukhasana(Cow face)

Position: –
This Exercise practiced in sitting. The spine should be upright and relaxed and the shoulders should be relaxed, and slightly rolled back and down. The patient’s hands should be reaching up and reaching down, making room for the stretch in your arms and shoulders. The pose also requires your full attention to the position of the knees, the elbows, the shoulders and the head. When you do it with attention to alignment, it is great for posture awareness.
Procedure:-

- Start in Staff Pose then cross your right leg over your left, stacking knee on top of knee and bringing your right heel to the outside of your left hip.
- Bend your left knee, bringing your left heel to the outside of your right hip.
- With your knees stacked and centered, press down evenly with your sitting bones.
- Elongate your spine and lift out of your lower back.
- Inhale, take your right arm out to the side and rotate it so your palm faces back and your thumb points down.
- As you exhale, bend your elbow and bring your right arm behind your back, with your palm facing out and the upper arm pulled in close to your body. Your elbow points towards your sacrum and your right fingers point towards the base of your neck.
- With your next inhale, take your left arm out to the side and up to the ceiling with your hand facing the midline.
- Bend your left elbow and reach your hand down toward your neck. Bring your elbow in close to your face and up toward the ceiling as your hand reaches down the spine.
- Reach your hands toward each other until they touch. Clasp hands or fingers if possible.
- To exit the pose, exhale and carefully release your arms out to your sides and return to Dandasana.
- Repeat on the opposite side[Figure:-3].

Figure:-3: Gomukhāsana (Cow face)

II. Dhanurasana (Bow Pose)

Position –This exercise practiced in supine lying.Lie on a mat on your stomach and straighten your legs behind you. Place your elbows on the ground and slide your shoulders down.

Procedure.

- Fold your knees, take your hands backward, and hold your ankles.
- Breathe in, and lift your chest off the ground and pull your legs up and towards the back.
- Look straight ahead with a smile on your face.

- Keep the pose stable while paying attention to your breath. Your body is now curved and as taut as a bow.
- Continue to take long, deep breaths as you relax in this pose. But, bend only as far as your body permits you to. Do not overdo the stretch.

1. After 15 -20 seconds, as you exhale, gently bring your legs and chest to the ground. Release the ankles and relax [Figure:-4].

Figure:-4: Dhanurasana (Bow Pose)

3. Basic breath awareness practice

The exercise described above is one such exercise that facilitates mindfulness by focusing on the breath.

Position - Sit in a relaxed position and make sure the shoulders are relaxed. Bring your awareness to the sensation of your body touching the cushion, your feet touching the floor, the feeling of the air in the room.

Procedure

- Slowly inhale through your nose, counting to five in your head.
- Let the air out from your mouth, counting to eight in your head as it leaves your lungs. Repeat several times.
- Gently bring your awareness to the breath as it moves in and out.
- Breathe from our belly rather than from our chest

DURATION

• To start with try to maintain this for 5 to 10 seconds. Do not take unnecessary strain, if you feel uncomfortable then release the posture immediately [Figure:-5].

Figure:-5: Basic breath awareness practice

Mindful movement practices (stretching)

Mindful movement practices (stretching) advised to the patient only for home programme. In Mindful movement with stretching practices of shoulder done in sitting, standing and side lying position. In figure 6 (a) showed stretching of posterior capsule and muscles (Horizontal adduction) of shoulder joint. This exercise given in standing position. In figure 6 (b) showed stretching abductors muscles of shoulder that given in sitting position. In figure 6 (c, d & e) showed stretching ER & IR muscles of shoulder that given in standing and side lying position. In figure 6 (f) showed stretching flexor muscles of shoulder that given in standing position. Straighten your hands with palms facing midline, fingers mutually pointing and place on the wall.

In every stretching exercise Count 1 – 10 slowly. Let go and return to neutral position. Feel the waves of relaxation…

Figure:-6:Mindful movement practices (shoulder stretching) a, b, c, d, e & f.

SHOULDER STABILIZATION EXERCISE

After manual therapy intervention, the exercises were incorporated for the training of shoulder flexors, abductors and external and internal group muscle.

Shoulder Stabilization Exercise for Abductors (Supraspinatus and Middle Deltoid)

1. Shoulder Stabilization Exercise for Supraspinatus

Patient will be sitting position. The patient pushing out against the wall. Initially the manoeuvres are done with the shoulder in less than 0 to 10° of abduction [Figure- 3: (a)]

2. Shoulder Stabilization Exercise for Deltoid

Patient will be sitting position. The patient pushing out against the therapist hand. Initially the manoeuvres are done with the shoulder in above than 90° of abduction (S.B. Brotzman et al. 1996; T. M. S kirven, et al. 2011) [Figure- 7: (b)].

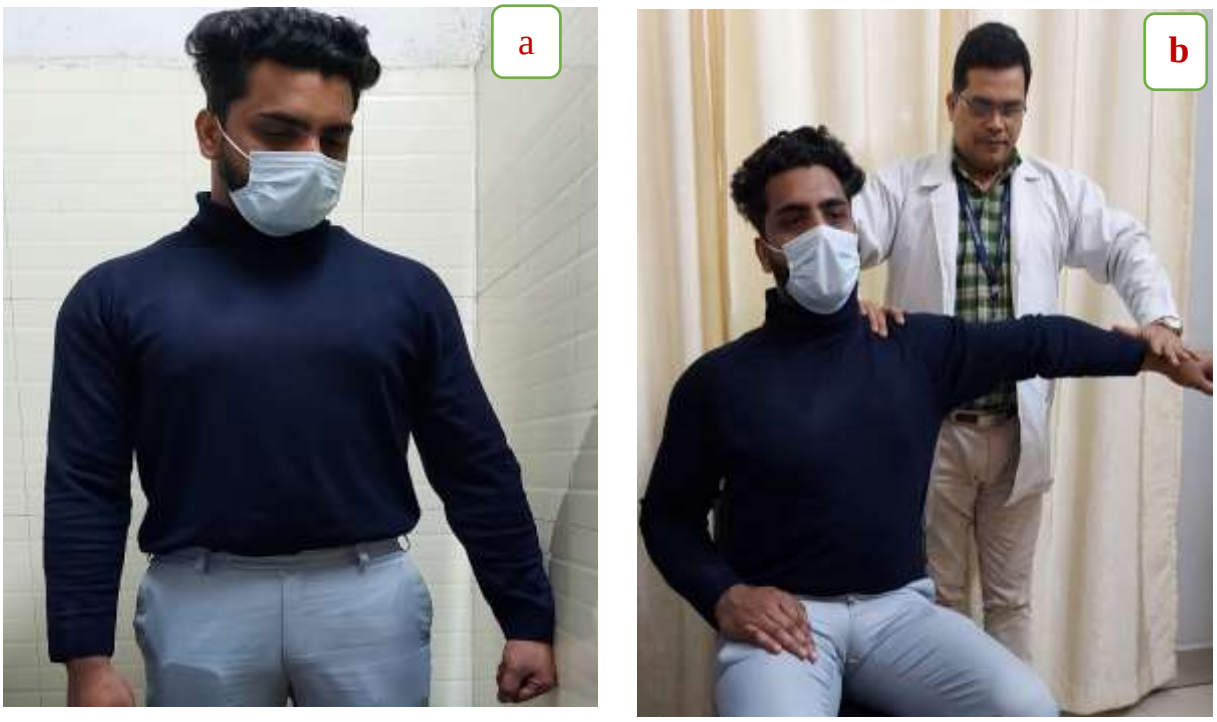

Figure- 7: Shoulder Stabilization Exercise for Supraspinatus and Shoulder Stabilization Exercise for Deltoid (a & b).

3. Shoulder Stabilization Exercise for External Rotators (Infraspinatus, Teres Minor, Posterior Deltoid).

Patient will be stand with the involved side of his body against a wall or therapist hand. Bend your elbow to 90° and told the patient performed external rotation against the wall. The patient arm should not move (S.B. Brotzman et al. 1996; Shoulder Strengthening Exercises 2010).

4. Shoulder Stabilization Exercise for Internal Rotators (Subscapularis and anterior deltoid)

Patient will be stand with the involved side of his body against a wall. Bend your elbow to 90° and told the patient performed internal rotation against therapist hand. The patient arm should not move (S.B. Brotzman 1996; American Academy of Orthopaedic Surgeons 2017; T. M. S kirven, et al. 2011).

5. Shoulder Stabilization Exercise for scapular muscles.

❖ Patient position and procedure: standing with shoulder flexed 90^{o} and hand supported against a wall. The patient is try to touch the wall by upper trunk.

Progression: have the patient quadruped position with both hands on a stable surface, so that one extremity bears the body weight and stabilizes against the shifting load to increase Serratus activity and lower trapezius activity respectively.

❖ Scapular elevation/depression: place your top hand superiorly and the other hand inferiorly around the scapula to provide manual resistance.

- Scapular protraction/retraction: place your top hand along the medial border and the other around the coracoid process to provide resistance.
- Scapular upward and downward rotation: place one hand around inferior angle and the other hand around the acromian and coracoid process to provide resistance (C. Kisner, et al. 2018).

The exercise will be performed 8 to 15 repetitions for 3 sets only 5 times / week for 8 weeks. It is performed with 5 to 10 second hold in each repetition a break of 1 min after each set (S.B. Brotzman, et al. 1996; Ju-hyun Lee, et al. 2018).

Moist Hot Pack (MHT)

The subject will be asked to lie down in a supine position and the shoulder is placed in the neutral position. The hot pack (standard size which had been stored in a hydro-collator tank of 74.5-80°C). Moist heat pack will be wrapped in towel with three to four folds over the affected shoulder. The pack was left in place for 10 to 15 minutes (Dhara N. Panchal, et al 2015; Kumar Neeraj, et al.2016) [Figure-8].

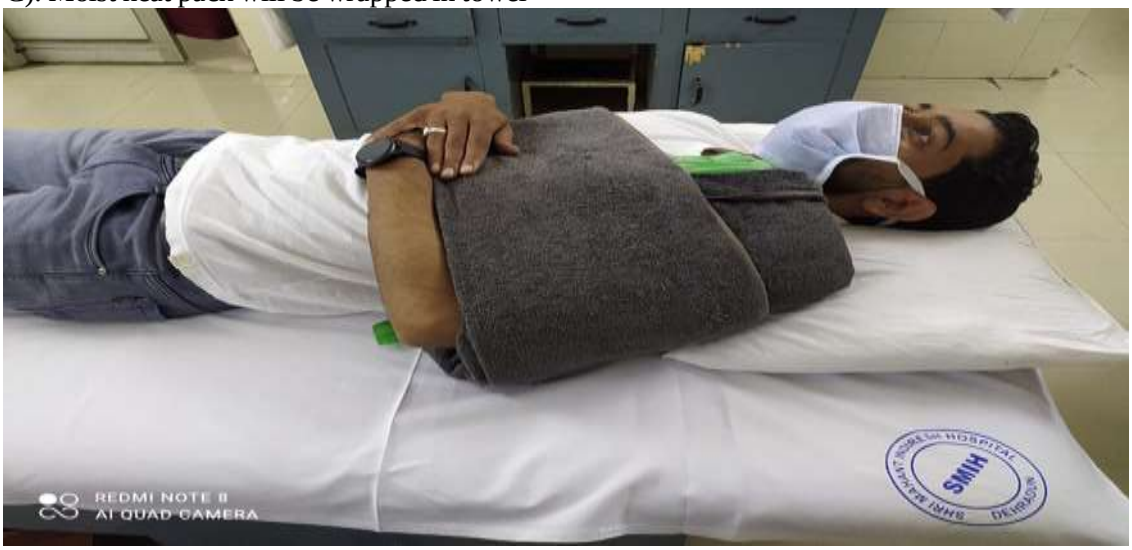

Figure-8: Application of Moist Heat Therapy in Shoulder joint

RESULTS

The data were analyzed using the statistical software SPSS 15 version. Anxiety & Depression, Quality Of Life and Mindfulness were measured by HADS, WHOQOL and FFMQ. The result was analysed by Repeated Measure ANOVA & Independent t- test after 0 week, 4 week & 8 week of treatment.

To analyze the difference of Group A and Group B the repeated measure ANOVA was used. Repeated measure ANOVA within-subject factor of timeline (week-0, week-4 & week-8) examined the within-group differences for the change of score in HADS. In Group-A study Anxiety F–Value 355.879 and in Depression F–Value 336.146. Group-B AnxietyF–Value-96.381. Depression F–Value-86.519 and its significant level is .000 in0 week, 4 week, and in 8 week of HADS.

In this study our results of within the group difference showed greater improvement in 8 weeks than 4 weeks in Group-A & B. It was found that significant level was less than 0.05 with showed significant difference and implies that there is improvement in anxiety depression score within the Group A& B(Table-2).

Outcome Measures	Group-A					Group-B				
	0 Week (Mean ±SD)	4 Week (Mean ±SD)	8 Week (Mean ±SD)	F - Value	Sign. level	0 Week (Mean ±SD)	4 Week (Mean ±SD)	8 Week (Mean ±SD)	F - Value	Sig n.le vel
ANXIETY	17.6774 ±3.41943	4.6452 ±2.71475	.0000 ±.00000	355.879	.000	19.8387 ±1.21372	13.5161 ±2.85039	10.2903 ±5.55094	96.381	.000

DEPRESSION	17.4516 ±3.9903 1	4.4516± 2.07908	.0323±. 17961	336.1 46	.000	19.2258 ±1.9443 9	13.129 0 ±3.451 97	10.3226 ±5.7815 1	86.5 19	.00 0

Table 2: Comparisons within Group A &B HADS of obtained by repeated measure ANOVA.

To analyze the difference in the WHOQOL within two groups (Group-A & Group-B), repeated measure ANOVA was used. Group-A Raw Score in Baseline 0 week of D1 F Value-169.940, D2 F Value-419.262, D3 F Value-706.105 and D4 F Value- 708.357. Transformed Scores(4-20)in Baseline 0 week of D1 F Value-93.621, D2 F Value-554.482, D3 F Value-724.386and D4 F Value-687.715.TransformingScore (0- 100) in Baseline 0 week of D1 F Value- 157.482, D2 F Value-470.743, D3 F Value-342.870and D4 F Value- 587.886.

Group-B Raw Score in Baseline 0 week of D1 F Value- .309, D2 F Value-10.170, D3 F Value-45.832and D4 F Value- 47.309.Transformed Scores (4-20) in Baseline 0 week of D1 F Value-40.789, D2 F Value-41.173, D3 F Value-6.305and D4 F Value- 96.479.Transforming Score (0- 100) of D1 F Value- 35.519, D2 F Value-42.508, D3 F Value-6.340and D4 F Value- 96.986.

The significant level of Raw Score of D1.736 and rest all Raw Score, Transformed Scores (4-20) and Transforming Score (0- 100) of D1, D2, D3 & D4thesignificant levels are .000.

In this study our results of within the group difference showed greater improvement in 8 weeks than 4 weeks in Group-A & B. It was found that significant level was less than 0.05 with showed significant difference and implies that there is improvement in QOL within the Group A& B(Table-3).

Outcome Measures		Group-A					Group-B				
		0 Week (Mean ±SD)	4 Week (Mean ±SD)	8 Week (Mean ±SD)	F - Value	Sign. level	0 Week (Mean ±SD)	4 Week (Mean ±SD)	8 Week (Mean ±SD)	F - Value	Sign. level
D1	Raw Score	16.9032± 2.76110	22.0000± 2.60768	26.9677± .91228	169. 940	.000	16.7742± 1.56439	16.6452± 4.78573	17.3226± 6.65025	.309	.736
	Transformed Scores 4-20	9.7419±1 .48251	12.3548± 2.47047	15.2581± .63075	93.6 21	.000	9.3548±1 .76160	9.8710±2 .33441	12.6774± 1.19407	40.78 9	.000
	Transforming Score 0-100	36.3226± 8.81055	54.7097± 10.90930	70.2903± 4.14884	157. 482	.000	35.7097± 5.63438	36.8065± 14.46932	54.0323± 7.73513	35.51 9	.000
D2	Raw Score	12.8710± 2.49989	19.3548± 1.88942	25.5806± .56416	419. 262	.000	14.6774± 4.47502	18.0323± 2.66438	17.5484± 2.37822	10.17 0	.000
	Transformed Scores 4-20	8.7419±1 .63233	13.0968± .94357	17.0000± .25820	554. 482	.000	8.7097±1 .63694	11.3226± 1.16582	11.7419± 1.65263	41.17 3	.000

	Transforming Score 0-100	30.5806±10.02920	56.8387±5.82579	81.2258±1.25724	470.743	.000	29.1290±10.36578	45.9677±7.07335	48.3871±10.27190	42.508	.000
D3	Raw Score	4.5484±1.33763	9.5161±1.02862	14.3548±.55066	706.105	.000	9.8387±2.25236	17.1290±8.10244	15.9677±4.53493	45.832	.000
	Transformed Scores 4-20	6.0000±1.78885	12.9355±1.41269	19.3226±.65254	724.386	.000	13.0645±2.96575	14.7419±1.69249	15.4194±2.74195	6.305	.003
	Transforming Score 0-100	13.8710±11.38930	55.9032±9.37854	93.2258±13.72518	342.870	.000	56.6452±18.49783	67.2258±10.51573	71.3871±17.19046	6.340	.003
D4	Raw Score	13.7742±3.66706	26.0323±2.63924	37.5806±1.28515	708.357	.000	17.4516±2.73055	21.1613±6.84152	28.5806±2.93001	47.309	.000
	Transformed Scores 4-20	7.2581±1.78825	13.0645±1.41269	19.0323±.65746	687.715	.000	10.1935±2.08837	14.8065±2.68849	14.7097±1.27000	96.479	.000
	Transforming Score 0-100	20.0968±12.08127	56.7097±8.80225	94.0000±4.09878	587.886	.000	38.7742±12.96845	67.5806±16.75863	67.0968±7.90086	96.986	.000

Table 3: Comparisons within Group A& B WHOQOL of obtained by repeated measure ANOVA.

To analyze the difference in the FFMQ within two groups (Group-A & Group-B), repeated measure ANOVA was used. Group-A Observing F Value- 55.260, Describing F Value-116.944, Acting with Awareness F Value-476.262, Non-Judging F Value-574.549 and Non- Reactivity F Value- 237.046.Group-BObserving F Value- 744.576, Describing F Value-547.638, Acting with Awareness F Value-775.659, Non-Judging F Value-176.917and Non- Reactivity F Value-67.889.Thesignificant level of all FFMQ Scores are .000.

In this study our results of within the group difference showed greater improvement in 8 weeks than 4 weeks in Group-A & B. It was found that significant level was less than 0.05 with showed significant difference and implies that there is improvement in Mindfulness within the Group A& B (Table-4).

Outcome Measures	Group-A					Group-B				
	0 Week (Mean ±SD)	4 Week (Mean ±SD)	8 Week (Mean ±SD)	F - Value	Sign. level	0 Week (Mean ±SD)	4 Week (Mean ±SD)	8 Week (Mean ±SD)	F - Value	Sign.level

Observing	23.6452±7.70086	16.1613±3.36746	9.8387±2.94502	55.260	.000	35.8065±1.30178	26.4839±2.33625	18.0645±2.33717	744.576	.000
Describing	29.4516±4.07299	24.2258±8.01960	10.4516±3.08587	116.944	.000	35.3226±2.18155	26.6452±2.90458	18.0968±3.35017	547.638	.000
Acting with Awareness	34.4516±3.70440	15.4516±4.41089	9.3548±1.56095	476.262	.000	34.8387±2.42345	26.5161±2.52812	17.1613±2.38183	775.659	.000
Non-Judging	34.0323±3.85127	14.8710±3.87076	9.9032±1.79545	574.549	.000	35.3871±2.24614	26.0323±2.30194	18.3548±5.01031	176.917	.000
Non-Reactivity	25.4194±4.28777	15.1613±2.89939	8.8387±1.50769	237.046	.000	29.9032±3.59031	22.7742±2.07701	16.6774±6.74975	67.889	.000

Table 4: Comparisons within Group A& B FFMQ of obtained by repeated measure ANOVA.

To analyze the difference between Group A and Group B the independent t- test was used. Independent t- test between subject factor of timeline (week-0, week-4 & week-8) examined the between group differences for the change of score in HADS.

In Group-A and Group-B study in Baseline (0 Week)Anxiety t–Value 0.29and its significant level is 0.545. In Depressiont–Value2.22and its significant level is0.013. In 4 week Anxiety t–Value 12.59 and in Depression t–Value12.54 and its significant level is0.0001. In 8 week Anxiety t–Value 10.30 and in Depression t–Value 9.525 and its significant level are0.0001 that showed highly significant.[Table-5].

To analyzed the difference in the FFMQ between two groups, (Group-A and Group-B), independent t test was used. When we compared with Group-A and Group-B, 4 weeks results showing significant as compared to 0 week. But in 8 weeks study our result showed greater improvement of Mindfulness than 4 weeks and 0 week.

In Group-A and Group-B study in Baseline (0 Week) Observing t–Value 8.68 and its significant level is 0.01.In Describing t–Value 6.97 and its significant level is 0.010. In Acting with Awareness t–Value 0.491 and its significant level is 0.678. Non-Judging t–Value 1.68 and its significant level is0.321. In Non-Reactivity t–Value 4.48 and its significant level are 0.001.

In Group-A and Group-B study in 4 Week Observing t–Values 14.33. In Describing t–Value 1.56. In Acting with Awareness t–Value 12.12. Non-Judging t–Value 13.67. In Non-Reactivity t–Value 11.94 and its significant level are 0.0001 that showed highly significant.

In Group-A and Group-B study in 8 Week Observing t–Values 12.03. In Describing t–Value 9.35. In Acting with Awareness t–Value 15.29. Non-Judging t–Value 8.84. In Non-Reactivity t–Value 6.37 and its significant level are 0.0001 that showed highly significant.

It was found that significant level was less than 0.05 with showed significant difference and implies that there is increase the Mindfulness between Group-A and Group-B post intervention 4 weeks and 8 weeks. In 4 weeks results showing significant as compared to 0

week. But In 8 week's results showing extremely significant as compared to 0 week & 4 weeks [Table- 5].

Outcome Measures	Duration	Group-A	Group-B		
		Mean ±SD	Mean ±SD	t- Value	Signi. level
HADS					
ANXIETY	0 Week	19.83+1.21	17.67+3.41	0.29	0.545
	4 Weeks	13.51+2.85	4.64+2.71	12.59	0.000
	8 Weeks	10.29+5.55	.0000+.00000	10.30	0.000
DEPRESSION	0 Week	19.22+1.94	17.45+3.99	2.22	0.013
	4 Weeks	13.12+3.45	4.45+2.07	12.54	0.000
	8 Weeks	10.32+5.78	.032+.179	9.525	0.000
FFMQ					
Observing	0 Week	35.80+1.30	23.64+7.70	8.68	0.01
	4 Week	26.48+2.33	16.16+3.36	14.33	0.000
	8 Week	18.06+2.33	9.83+2.94	12.03	0.000
Describing	0 Week	35.22+2.18	29.45+4.07	6.97	0.010
	4 Week	26.64+2.90	24.22+8.01	1.56	0.321
	8 Week	18.09+3.35	10.45+3.08	9.35	0.000
Acting with Awareness	0 Week	34.84+2.42	34.45+3.70	0.491	0.678
	4 Week	26.51+2.52	15.45+4.41	12.12	0.000
	8 Week	17.16+2.38	9.35+1.56	15.29	0.000
Non-Judging	0 Week	35.38+2.24	34.03+3.85	1.68	0.321
	4 Week	26.03+2.30	14.87+3.87	13.67	0.000
	8 Week	18.35+5.01	9.90+1.79	8.84	0.000
Non- Reactivity	0 Week	29.90+3.59	25.41+4.28	4.48	0.001
	4 Weeks	22.77+2.07	15.16+2.89	11.94	0.000
	8 Weeks	16.67+6.74	8.83+1.50	6.37	0.000

Table 5: Comparisons between HADS, &FFMQ Group A and Group B obtained by independent t-test.

To analyze the difference in the WHOQOL within two groups (Group-A & Group-B), repeated measure ANOVA was used. Group-A Raw Score in Baseline 0 week of D1 F Value-169.940, D2 F Value-419.262, D3 F Value-706.105 and D4 F Value- 708.357. Transformed Scores(4-20)in Baseline 0 week of D1 F Value-93.621, D2 F Value-554.482, D3 F Value-724.386and D4 F Value-687.715.TransformingScore (0- 100) in Baseline 0 week of D1 F Value- 157.482, D2 F Value-470.743, D3 F Value-342.870and D4 F Value- 587.886.

Group-B Raw Score in Baseline 0 week of D1 F Value- .309, D2 F Value-10.170, D3 F Value-45.832and D4 F Value- 47.309.Transformed Scores (4-20) in Baseline 0 week of D1 F Value-40.789, D2 F Value-41.173, D3 F Value-6.305and D4 F Value- 96.479.Transforming Score (0- 100) of D1 F Value- 35.519, D2 F Value-42.508, D3 F Value-6.340and D4 F Value- 96.986.

The significant level of Raw Score of D1.736 and rest all Raw Score, Transformed Scores (4-20) and Transforming Score (0- 100) of D1, D2, D3 & D4 the significant levels are .000.

In this study our results of within the group difference showed greater improvement in 8 weeks than 4 weeks in Group-A & B. It was found that significant level was less than 0.05 with showed significant difference and implies that there is improvement in QOL within the Group A & B (Table-6).

Outcome Measures		Group-A			Group-B								
		0 Week (Mean ±SD)	4 Week (Mean ±SD)	8 Week (Mean ±SD)	0 Week (Mean ±SD)	4 Week (Mean ±SD)	8 Week (Mean ±SD)	t– Value 0 Week	t– Value 4 Week	t– Value 8 Week	Sign. level O Week	Sign. level 4 Week	Sign. level 8 Week
D1	**Raw Score**	16.77+1.56	16.64+4.78	17.32+6.65	16.90+2.76	22.00+2.60	26.96+.912	0.22	5.36	16.86	0.675	0.000	0.000
	Transformed Scores 4-20	9.35+1.76	9.87+2.33	12.67+1.19	9.74+1.48	12.35+2.47	15.25+.63	0.873	6.174	10.75	0.585	0.000	0.000
	Transforming Score 0-100	35.70+5.63	36.80+14.46	54.03+7.73	36.32+8.81	54.70+10.90	70.23+4.14	0.3315	5.507	10.137	0.685	0.000	0.000
	Raw Score	14.67+4.47	18.03+2.66	17.54+2.37	12.87+2.49	19.35+1.88	25.58+.564	1.948	2.260	18.398	o.321	0.013	0.000

D 2	**Transformed Scores 4-20**	8.70+1.63	11.32 +1.16	11.74 +1.65	8.74+1.63	13.09+ .94	17.00+ .25	0.097	6.629	17.65	0.585	0.000	0.000
	Transforming Score 0-100	29.12+ 10.36	45.96 +7.07	48.38 +10.27	30.58+10.02	56.83+ 5.82	81.22+ 1.25	0.565	6.611	17.684	0.574	0.000	0.000
D 3	**Raw Score**	9.83+2.25	17.12 +8.10	15.96 +4.53	4.54+1.33	9.51+1 .02	14.35+ .55	10.29	5.190	1.932	0.000	0.000	0.000
	Transformed Scores 4-20	13.06+ 2.96	14.74 +1.69	15.41 +2.74	6.00+1.78	12.93+ 1.41	19.32+ .652	11.405	4.617	7.757	0.000	0.000	0.000
	Transforming Score 0-100	56.64+ 18.49	67.22 +10.51	71.38 +17.19	13.87+11.38	55.90+ 9.37	93.22+ 13.72	10.994	4.492	5.54	0.000	0.000	0.000
D 4	**Raw Score**	17.45+ 2.73	21.16 +6.84	28.58 +2.93	13.77+3 .66	26.03+ 2.63	37.58+ 1.28	4.493	3.717	15.70	0.000	0.001	0.000
	Transformed Scores 4-20	10.19+ 2.08	14.80 +2.68	14.70 +1.27	7.25+1.78	13.06+ 1.41	19.03+ .65	6.01	3.186	16.980	0.000	0.003	0.000
	Transforming Score 0-100	38.77+ 12.96	67.58 +16.75	67.09 +7.90	20.09+12.08	56.70+ 8.80	94.00+ 4.09	5.892	3.209	16.85	0.000	0.002	0.000

Table 6: Comparisons between WHOQOL A and Group B obtained by independent t- test.

DISCUSSION:

The findings of the present study highlights that Group-A and Group-B are more effective in reducing Anxiety & Depression, increase Quality Of Life and Mindfulness were measured by HADS, WHOQOL and FFMQ. In this study results of within the group difference showed greater improvement in 8 weeks than 4 weeks in Group-A & B. It was found that significant level was less than 0.05 with showed significant difference and implies that there is improvement in anxiety depression score within the Group A & B. To analyze the difference in the WHOQOL within two groups (Group-A & Group-B) repeated measure ANOVA was used. The study within group difference showed greater improvement in 8 weeks than 4 weeks in Group-A & B Quality Of Life. In FFMQ within two groups (Group-A & Group-B) difference showed greater improvement in 8 weeks than 4 weeks in Group-A & B. It was found that significant level was less than 0.05 with showed significant difference and implies that there is

improvement in Mindfulness within the Group A & B.

To analyze the difference between Group A and Group B the independent t- test was used. Independent t- test between subject factor of timeline (week-0, week-4 & week-8) examined the between group differences for the change of score in HADS, WHOQOL and FFMQ. In this study results of within the group difference showed greater improvement in 8 weeks than 4 weeks in Group-A & B. It was found that significant level was less than 0.05 with showed significant difference.

The term frozen shoulder refers to a common shoulder condition characterized by the global restriction in the shoulder range of motion in a capsular pattern. The capsular pattern in the shoulder is characterized by most limitation of passive lateral rotation and abduction. Neviaser called it adhesive capsulitis, as he, under arthroscopy, observed that the capsule looked thickened and adhered to underlying bone and could be peeled off from the bone (Rizwan Haideret al.2014).

In this study we found that in Group-A there are significantly increase muscle strength of Shoulder Joint than control group. J. Sokk, H. Gapeyeva, et al. 2007 stated Frozen shoulder syndrome (FSS) is typically characterized by shoulder pain, a limited range of motion (ROM) and gradual loss of strength of the shoulder muscles. 4-week individualized rehabilitation on shoulder muscle function in patients with FSS. There are significant changes in shoulder muscle strength. (J. Sokk, H. Gapeyeva, et al. 2007)

In our study Group-A showed decrease Anxiety & Depression, increase Quality Of Life and Mindfulness than Group-B study. When we compared with Mean ±SD it was found that 0 week showed insignificant, 4 week showed significant and 8 week showed highly significant in diabetic frozen shoulder patients.

CONCLUSION:

Our study concluded that Mindfulness-Based Stress Reduction (MBSR) program, Stabilization Exercise and Moist Heat Therapy (MHT) in Patients with Diabetic Frozen Shoulder showed significant improvement in Anxiety & Depression, Quality Of Life and Mindfulness in 4th week& 8th week of treatment programme but 8 weeks results showing extremely significant as compared to 4 weeks at p values (<0.0001). On comparing group A and group B the results were significant improvement in group A and there is insignificant improvement was seen in group B in Anxiety & Depression, Quality Of Life and Mindfulness in 4th week& 8th week of treatment programme.

BIBLIOGRAPHY

[1] A. Cebolla, A. García-Palacios, J. Soler, V. Guillen, R. Baños & C. Botella (2012). Psychometric properties of the Spanish validation of the Five Facets of Mindfulness Questionnaire (FFMQ).Eur. J. Psychiatry. 26 (2): 118 to 126.

[2] American Academy of Orthopaedic Surgeons Rotator Cuff and Shoulder Conditioning Program Strengthening Exercise. orthoinfo.aaos.org › pdfs › 2017-rehab_shoulder.

[3] C. R. Kothari (2004). Research Methodology Methods and Techniques. Second Revised edition. New Age International (P) Limited, Publishers. ISBN (13): 978-81-224-2488.

[4] Cecile A. Lengacher1,Versie Johnson-Mallard et al. (2009). Randomized controlled trial of mindfulness-based stress reduction (MBSR) for survivors of breast cancer Psycho-Oncology. Volume-18: PP-1261 to 1272. DOI: 10.1002/pon.1529.

[5] Census and Sample Survey, Dehradun (2018).

[6] Cintia Garcilazo, Javier A. Cavallasca and Jorge L. Musuruana (2010). Shoulder Manifestations of Diabetes Mellitus. 6 (5): 334 to 340. DOI:10.2174/157339910793360824.

[7] Courtney E. Ackerman, (2020).Mindfulness-Based Stress Reduction Exercises and Courses. PositivePsychology.com.

[8] Dhara N. Panchal & Charu Eapen (2015). Effectiveness Of End-Range Mobilization And Interferential Current Or Stretching Exercise And Moist Heat In Treatment Of Frozen Shoulder- A Randomized Clinical Trial. Int J Cur Res Rev. 7 (14): 21-26.

[9] G. C. Lloyd-Roberts & P. R. French (1959). Periarthritis of the Shoulder. A Study of The Disease And Its Treatment. British Medical Journal. 569 to 571.
[10] J. F. Bridgman (1972). Periarthritis of the shoulder and diabetes mellitus. Ann. rheum. Dis. 31: 69 to71.
[11] Juhyun Lee, Tae-ho Kim, Kyu-bong & Lim (2018). Effects of eccentric control exercise for wrist extensor and shoulder stabilization exercise on the pain and functions of tennis elbow. J. Phys. Ther. Sci. 30: 590 to 594.
[12] Kumar Neeraj & Verma Shiv (2016). To Compare the Effect of Strengthening Neck Exercise and McKenzie Neck Exercise In Neck Pain Subject.Br J Med Health Res. 3 (10): 69 to 79.www.bjmhr.com.
[13] M. J. Herreroa, J. Blancha, J.M. Peria, J. De Pabloa, L. Pintora& A. Bulbenab (2003).A validation study of the hospital anxiety and depression scale (HADS) in a Spanish population. General Hospital Psychiatry. 25: 277 to 283.
[14] Rita Rastogi, Kalyani et al. (2014). A comprehensive analysis of shoulder muscles among people with diabetes. Lancet Diabetes Endocrinol. 2 (10): 819 to 829.
[15] S.B. Brotzman and Kevin E. Wilk (1996). Clinical Orthopaedics Rehabilitation 2nd edition. Mosby Elsevier.
[16] Simon Carette, Helene Moffet&Johanne Tardif (2003). Intra-articular Corticosteroids, Supervised Physiotherapy, or a Combination of the Two in the Treatment of Adhesive Capsulitis of the Shoulder. Arthritis & Rheumatism. 48 (3): 829 to 838.
[17] Skevington, S. M., Lotfy, M., O'Connell, K. A. (2004). The World Health Organization's WHOQOL-BREF quality of life assessment: psychometric properties and results of the international field trial. A report from the WHOQOL group. Quality of Life Research: An International Journal of Quality of Life Aspects of Treatment, Care and Rehabilitation. 13 (2): 299–310. https://doi.org/10.1023/B:QURE.0000018486.91360.00
[18] T. M. S kirven, A. Lee Osterman&Fedorezyk (2011). Rehabilitation of the hand & upper extremity. 2: 6th edition. Elsevier publication. ISBN: 978-0-323-05602-1.
[19] World Health Organization - Quality Of Life [WHO QOL – BREF]; World Health Organization (1996).