

## 8 DISCUSSION

Low back pain risk factors include previous back pain episodes, high physical demands of work, low job satisfaction, age, back weakness, and smoking (Latimer et al., 1999; Deyo et al., 2001; Waddell et al., 2001). Care seeking and disability due to chronic low back pain depend more on psychosocial issues than on individual clinical features or workplace physical demands (Waddell et al., 2001). Identifying and addressing these psychosocial factors helps improve outcomes and limit costs (Chou, 2007). Among the treatments for CLBP, there is variable evidence to support effectiveness of nonpharmacologic (Chou, 2007) and medication (Chou R, 2007) management. Yoga, in comparison to spinal manipulation, physical therapy, and acupuncture, may be more cost effective because it can be delivered in a group format and self-administered at home. However, actual cost analysis of yoga interventions is needed.

In an exploration of patient experiences review (Hsu et al., 2010) on use of CAM in low back pain revealed that several positive outcomes that participants experienced in CAM trials. The most frequently mentioned themes were increased options and hope, increased ability to relax, positive changes in emotional states, increased body awareness, and changes in thinking that increased the ability to cope with back pain.

A small randomized controlled trial, pilot study demonstrated trends for the yoga group in terms of improved balance and flexibility, and decreased disability and depression (Galantino et al., 2004). However, the study was weakened by the small sample size (n=22 participants) and a high dropout rate among the control group. As such, no statistical significance was observed. The impact of Iyengar yoga therapy was assessed in a 16-week, randomized controlled trial involving subjects with non-specific CLBP compared to an educational control group (Williams et al., 2005). The yoga subjects had less pain (Short Form-McGill Pain Questionnaire) and lower functional disability

(Pain Disability Index) than the controls. Unfortunately there was a 30% drop-out rate in this study. Williams et al. conducted another 24-week study that showed significantly greater reductions in functional disability (Oswestry Disability Index), pain intensity (Visual Analog Scale) and depression (Beck Depression Inventory-Second Edition) among the subjects randomized to the yoga intervention group (Williams et al., 2009). Both of these studies were limited by a reliance on self-report measures, a relatively healthy study population, and lack of controls for attention and physical activity between the treatment and control groups (Williams et al., 2005)

80 patients with CLBP participated in an intensive seven day long, residential yoga program. The effect of yoga on disability (Oswestry Disability Index), quality of life (World Health Organization Quality of Life-BREF) and flexibility was studied (Tekur et al., 2008; 2010). The intervention group practiced daily meditation, yoga exercise, chanting and went to lectures. The control group followed a daily routine of exercise, non-yogic breathing exercises and additionally filled their time watching nature programs. This control is different than the usual or no care control used in other studies. There was a significant difference in disability between groups, with the yoga group experiencing a greater improvement than the control group. The yoga group showed a greater increase in flexibility and reduction in pain (section 1 of the Oswestry Disability Index) than the control group (Tekur et al., 2008; 2010).

Yoga's effect on psychological health has not been well characterized in the scientific literature to date. Galantino et al. conducted a pilot study of depression and a Hatha yoga intervention (Galantino et al., 2004). Groessl et al. studied the effect of yoga on depression and quality of life (Short-Form 12 version 2) in veterans with back pain (Groessl et al., 2008). They found significant improvements in depression, and a trend towards significant improvements for the Mental Health Scale of the SF-12. The

improvement in depression tended to be associated with the subjects' self reported amount of home practice. The impact of Iyengar yoga on depression (Beck Depression Inventory) was studied in subjects with CLBP (Williams et al., 2009). The subjects randomized to the yoga group showed greater improvements in depression than those in the control group. One limit of the study was that yoga group received more attention than the self-directed control group. Another limit was the lack of controls for physical activity between the groups.

One randomized controlled trial (Tilbrook et al., 2011) and an affiliated pilot study (Cox et al., 2010) studied yoga versus "usual care" with the mental health Short Form 12. The pilot study found no significant difference, but it was under-powered (n =20) (Cox et al., 2010). Their follow-up study was adequately powered. They still found no significant difference in mental health function at the 3, 6 and 12 month assessments (although the 3- and 6-month assessments demonstrated a trend towards improvement) (Tilbrook et al., 2011).

The current study was a prospective randomized control study on 88 nursing professionals with chronic low back pain. Results showed significant improvements in all variables except three (environmental domain of quality of life, Trait anxiety, and Low frequency of HRV) variables for Yoga group, ( $p < 0.01$ ) comparison (pre-post) after six weeks of Yoga intervention. In Control (exercise) group also showed significant improvements on all variables except five variables (environmental domain of quality of life, Trait anxiety, all three parameters of heart rate variability - LF, HF, LF/HF).

There was significant difference between groups (YG post verses CG post) after six weeks intervention in Numerical Rating Scale (NRS)  $p < 0.001$  ; Roland Morris Disability (RMDQ)  $p < 0.001$  ; Fear Avoidance Belief Questionnaire – Physical (FABQ-

Ph) $p<0.001$  ;Fear Avoidance Belief Questionnaire – Work (FABQ-W) $p<0.001$ ; State Anxiety  $p<0.001$ ; Beck’s Depression Inventory (BDI)  $p<0.001$ ; Perceived Stress Scale (PSS)  $p<0.001$ ; Low Frequency (LF)  $p=0.01$  and LF/HF ratio  $p<0.001$  of Heart rate variability (HRV); Physical ( $p<0.001$ ), psychological ( $p<0.001$ ) and Social ( $p<0.001$ ) domains of Quality of Life.

There was insignificant difference between groups (YG post verses CG post) after six weeks intervention in Trait Anxiety ( $p=0.025$ ); High Frequency (HF) of Heart rate variability (HRV); environmental domain ( $p=0.25$ ) of quality of life;

### **Distinct features of the present study**

- a) The present study is specific to nursing professionals chronic low back pain (CLBP) as the causative factors for CLBP differs in different occupations.
- b) The present study is having matched active control(Exercise) group which helps us to evaluate the factual difference between the Yoga and Exercises intervention
- c) The present study had larger sample size compared to earlier studies, which was calculated after considering all the parameters of the study.
- d) A specific Yoga module is designed, validated and pilot tested before its intervention
- e) The current study is having wide range of parameters which will assess the impact of intervention on Pain, Disability, Psychological (Fear, Anxiety, Depression, HRV) and Quality of life parameters.

### **Mechanism of yoga**

- a. The physical practices of Yoga will give benefits of exercise viz. decreases functional disability, pain, improves flexibility, strengthens back and

abdominal muscles and also have positive impact on physical domain quality of life (QOL). Minor positive impact observed on other domains of QOL

- b. Pranayama and relaxation techniques will help in reduces stress, anxiety, depression and fear avoidance. These practices also have positive impact on cognitive-behavioral
- c. Integrated Yoga relaxes the spasm in the spinal muscles thus nourishes the spinal muscles and strengthens the same
- d. Stress reduction and Self-regulatory effect: (i) to cognize the sources and patterns of their emotional responses to pain, (ii) to restore their freedom to change the responses to these situations as well as to the chronic pain, and (iii) learn to touch the blissful bed of inner silence during all joyful moments. Training in Sahaja yoga for 8 weeks in cases of major depression showed significant improvement in Hamilton Rating Scale for Depression and Anxiety (Sharma et al., 2005).
- e. Reduced autonomic arousal. Lipchik et al showed that the increased sense of personal control over pain following a pain management program of cognitive behavioral therapy (CBT) was accompanied by reduction in negativity (Lipchik et al., 1993). The divine hymn sessions (bhakti yoga) were meant to foster an understanding that devotion and surrender to the Divine unfolds the subtle emotions of pure love which help in moving towards positive emotional affective states and clearing the negative affect that enhance healing and pain management.
- f. The science of yoga and Vedānta (Nagaratna et al., 2000) has a systematic methodology to train a person to be established in the experiential knowledge of one's true nature which is a state of unchanging state of bliss

(sacchidānanda ). This is the major cognitive behavioral change that makes the participant stable under all demanding situations (samatvam) that manifests as improved quality of life.

In the present we found both Integrated Yoga and physical exercises are effective in the management of CLBP. We also observed that Integrated Yoga was superior compared to the physical exercises. The reason behind this may be, Yoga is more of integrated or holistic (Biopsychosocial) model of treatment where physical exercises focused on physical pain, undermining the other domains. CLBP in nursing professions caused due to diversified (Biopsychosocial) causative and risk factors compared to construction worker labor where the CLBP is mainly due to physical causative factors but we can't deny role of other domains.

## 9 SUMMARY AND CONCLUSION

Chronic Low Back Pain (CLBP) is multifactorial demoralizing condition highly prevalent in nursing professionals which demands multidimensional treatment module to address the diverse causative and risk factors.

The current study has that nursing professionals with CLBP had high stress, fear avoidance, anxiety and depression levels and decreased quality of life (QOL). There was negative correlation between stress and QOL.

This RCT has shown that integrated Yoga is better than physical exercises as its having greater reduction in pain, functional disability with higher positive impact on psychological parameters (stress, anxiety, depression and fear avoidance) and quality of life after six weeks intervention compare to control (exercise) group in nursing professional with CLBP is related. There is a need to incorporate Yoga for nursing professionals to enhance quality of life, prevent and treating the CLBP.

## 10 SWOC ANALYSIS

### 10.1 Strength

- The present study is specific to nursing professionals with chronic low back pain (CLBP) as the causative factors for CLBP differs in different occupations.
- The present study is having matched active control(exercise) group which helps us to evaluate the factual difference between the Yoga and Exercises interventions
- The present study prospective RCT with larger sample size compared to earlier studies which is calculated after considering all the parameters of the study.
- A specific Yoga module was designed, validated and pilot tested before its intervention
- The current study is having wide range of parameters which will assess the impact of intervention on Pain, Disability, Psychological (Fear, Anxiety, Depression, HRV) and Quality of life parameters.
- The present study showed statistical significant positive impact on most parameters in post intervention analysis for between groups, which encourages the acceptability of the Yoga Intervention.
- Yoga is feasible, cost effective treatment option compared to other conventional management of CLBP.
- In addition to healing the CLBP, Yoga intervention improves psychological components like anxiety and depression which contribute to better attitude and functioning of nursing professionals.

## **10.2 Weakness**

- Present study lacks in objective parameters like Magnetic Resonance Imaging, biochemical parameters.
- Its single center RCT as multi-center study will further strengthens the study outcome

## **10.3 Opportunity**

- The present showed Yoga intervention is better than exercise, there is a need to incorporate Yoga for nursing professionals to enhance quality of life, prevent and treat the CLBP.

## **10.4 Challenges**

- Forming policy to incorporate integrated Yoga in nursing professionals