

EFFECT OF YOGIC EXERCISES ON SYMPTOMS OF MUSCULOSKELETAL DISORDERS OF UPPER LIMBS AMONG COMPUTER USERS: A RANDOMISED CONTROLLED TRIAL

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ABSTRACT

BACKGROUND AND OBJECTIVES: Upper extremity musculoskeletal disorders (MSD) are very common in regular computer users and leading cause of work related illness. The objective of the present study is to evaluate effectiveness of yogic exercises in the improvement of symptoms of MSDs of upper limbs. **MATERIALS AND METHODS:** 60 study participants were randomly divided into two groups that is yoga with counselling and only counselling group for 12 weeks. Symptom severity and functional status were assessed using the self administered Boston Carpal Tunnel Questionnaire and predesigned symptom questionnaire before and after intervention. **RESULTS:** There was significant reduction in symptom severity score ($P = 0.002$) and improvement in functional status score in yoga with counselling group when compared to only counselling group. There is also a significant decrease in self reported symptoms like CT myalgia symptom ($P = 0.019$) and improvement in weakness. **CONCLUSION:** The present study showed a yoga based regimen is more effective than counselling alone in relieving symptoms of computer related musculoskeletal disorders.

Key words: Boston Carpal Tunnel Questionnaire, computer users, musculoskeletal disorders, yoga

INTRODUCTION

Computers have become an epitome of modern life. The computer, a hallmark of technological advancement, has ushered in a new genre of occupational health problem,

i.e., of computer-related health problems. Musculoskeletal disorders (MSD) are common among computer users and result in decreased motor performance.^[1] The most frequent MSD is carpal tunnel syndrome (CTS), followed by tendonitis.^[2] MSDs are the most

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common self-reported work-related illness in the U.K, with upper limb disorders being the second highest reported condition.^[3] India, being the forerunner in the cyber world, is slowly awakening to this group of modern occupational diseases.

Computer users often adopt poor wrist postures; working in deviated postures and incorrect adjustment of workstation are thought to increase the risk of injury.^[4] Symptoms of MSD can appear in the neck, shoulders, elbows and wrists.^[5] MSD can be severely disabling, leading to unemployment and chronic pain or weakness.^[6] To some extent the risk of repetitive strain injuries can be reduced by proper adjustment of work stations and good work practices.^[7]

Yoga and relaxation techniques have been used to help alleviate musculoskeletal symptoms. The studies have shown significant improvement in reducing the symptoms of MSD. Yoga was purposed to be helpful because stretching may relieve compression in carpal tunnel, better joint postures may decrease intermittent compression over nerves and blood flow may be improved to decrease ischemic effects in the median nerves.^[8]

The present study was proposed to evaluate whether a programme of specially designed yoga and relaxation techniques will offer an effective treatment for symptomatic participants among regular computer users.

MATERIALS AND METHODS

The present study was conducted in the Jawaharlal Nehru Medical College, Belgaum,

among symptomatic administrative and supporting staff aged less than 45 years, working regularly on computers for more than 10-15 h/week for at least 1 year to assess the effect of yogic exercise on symptoms of MSDs.

Subjects with physical deformity of the upper limbs or neck, previous history of diagnosed neuropathy or history of thyroid disease and those, taking long-term medications were excluded. Sixty eligible and consenting subjects were enrolled in the study. Descriptive data of the participants like age, sex, personal history of alcoholism and smoking, occupational history of the subjects regarding years of employment and, duration of work/week were collected by a pre-designed and pre-tested proforma. Symptoms severity and functional status were assessed using a self-administered Boston Carpal Tunnel Questionnaire and pre-designed self-reported symptom questionnaire.

After recording the above parameters, all the 58 participants received counselling by experts from the Physiotherapy Department for 3 days for 1 h. Twenty-nine randomly chosen participants received training from a yoga expert of the Yoga Centre for 3 days for 1 h based on the teaching of yoga master Dr. B. K. S. Iyenger.^[7] Participants performed the yogic exercises daily in the morning for 1 h, 6 days in a week, for 3 months. Observation was done twice weekly. The remaining 29 participants acted as controls.

The following are the yoga postures:

- Dandasana (sitting with extension of the trunk)
- Namaste (hands in prayer position)
- Urdhvahastasana (arms extended overhead)

- Parvatasana (arms extended overhead with fingers interlocked)
- Garudasana (arms interlocked in front of the body)
- Bharadvajasana (chair twists)
- Tadasana (standing, mountain pose)
- Half uttanasana. (90-Degree forward bend to wait)
- Virabhadrasana1, arms only (arms extended overhead with palms together in prayer position)
- Urdhvamukhsvanasana (dog pose with chair, with special emphasis on hand placement)
- Savasana (relaxation)

After 3 months the same questionnaires were given to the subjects in both the groups and were assessed.

RESULTS

A total of 60 participants, who fulfilled the eligibility criteria, were studied. Of these 60 participants one participant from each group who withdraw from the study was excluded. A total of 58 participants were analyzed [Table 1]. The readings taken before intervention were considered as baseline values. Paired and unpaired “*t*” tests were used to compare the means of the continuous variables. Chi-square test was used to compare the rates of categorical variables. *P* value < 0.05 was considered statistically significant.

Yoga with counselling group has shown more improvement in both symptom severity score and functional status score when compared with only the counselling group. Symptom score

was statistically significant (*P* = 0.002), but functional status score showed a trend toward improvement (0.064) [Table 2].

Symptoms, namely cervico-thoracic myalgia, tingling, numbness, weakness and nocturnal exacerbations, were compared between the two groups. Among these, the mean difference for the symptom CT myalgia showed statistically significant decrease in yoga with counselling group when compared with the only counselling group (*P* = 0.019). Weakness

Table 1: Demographic profile of the participants

Variables	Yoga with counselling	Counselling
Age (Mean±SD)	34.31±8.12	31.24±5.17
Sex		
Male	23	19
Female	06	10
Length of service (Mean±SD)*	10.00±3.95	7.96±3.20
Mean hrs/week (Mean±SD)	28.82±7.92	28.58±6.34
Nature of work		
Keyboard	13	10
Mouse	07	03
Both	05	07
Breaks during working hours		
Yes	05	07
No	24	22

*Significant at *P*<0.05

Table 2: Symptom severity score and functional status score before and after intervention

Variables	Yoga with counselling	Counselling
Symptom severity score*		
Before	1.53±0.22	1.39±0.20
After	1.22±0.13	1.25±0.12
Mean difference	-0.31±0.20	-0.14±0.18
Functional status score		
Before	1.09±0.14	1.06±0.11
After	1.02±0.06	1.05±0.08
Mean difference	-0.064±0.11	-0.007±0.11

*Significant at *P*<0.05

showed trend toward improvement in yoga with counselling group as compared with only counselling group ($P = 0.06$) [Table 3].

Comparatively, the mean difference for the other three symptoms between the groups was not statistically significant.

DISCUSSION

Worldwide, 25% of computer users are already suffering from MSDs. The root cause includes a high level of strain, high repetition, holding long isometric contractions, poor posture and direct pressure over the nerves. Characteristic complaints of these disorders include pain, weakness, numbness, loss of function and a variety of neuromuscular symptoms. These conditions are far easier to prevent than cure once contracted. By having an ergonomically good work station and using alternative therapies like exercise, yoga can prevent and improve the symptoms of MSD.

Table 3: Self reported symptoms before and after intervention

<i>Variables</i>	<i>Yoga with counselling</i>	<i>Counselling</i>
CT myalgia*		
Before	28	29
After	20	27
Tingling		
Before	03	01
After	01	01
Numbness		
Before	05	04
After	01	01
Weakness		
Before	05	04
After	00	03
Nocturnal Exacerbation		
Before	05	03
After	01	02

*Significant at $P < 0.05$

During recent years, there has been a worldwide interest in yoga. The effect of yoga is not immediately seen on the body as is the case with other physical exercise. It takes a longer period to repair injuries incurred over a long time. Yoga is not a technique or a tool but a way of life with discipline.

All the demographic profiles between the two groups were comparable except for the length of service which was higher in yoga with counselling group and was found to be significant.

The present study showed that symptom severity score and functional status score had decreased in yoga with counselling group when compared with the only counselling group, and also there was a reduction in self-reported symptoms like CT myalgia and weakness in yoga with counselling group. These findings are consistent with previous studies.^[8,9]

Hence, yoga is a potential, useful intervention for computer-related musculoskeletal disorders.

CONCLUSION

The findings of the present study with 12 weeks of yogic exercise with counselling as intervention indicates that yoga with counselling group has shown improvement in symptom severity score, self-reported symptoms like CT myalgia and weakness. Hence, the study revealed that a yoga-based regimen is more effective than counselling alone in relieving computer-related musculoskeletal disorders.

However, further studies are required including large sample size and longer observation

periods. Also, more intense training should be carried out in order to achieve a better evaluation of the potentials of the practice of yoga to modify these disorders. A formal yoga program should be initiated at work places with high incidence of MSD to evaluate the long-term effects.

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