ABSTRACT: BACKGROUND: Inspite of the benefits of yoga not much is being done for incorporating it along with conventional methods of treatment for chronic diseases. It has been a subject of research for the past few decades as a complementary therapy for chronic diseases, but still lot needs to be done regarding it being used as a non-pharmaceutical method for treatment. This study was carried out to find out the benefits of yoga if practiced regularly for a period of 3 months. OBJECTIVES: To find out the awareness regarding the benefits of yoga and to find out the benefits on various ailments of regular yoga practice for a period of 3 months. MATERIALS & METHODS: Data was collected from adults who followed a regular regime of Yoga from 3 centers in the city of Kakinada in a pretested questionnaire which contained both open and close ended questions in the beginning and at the end of 3 months of regular yoga practice. Analysis was done using epi info and significance was tested using Chi square tests. RESULTS: There was significant improvement in Joint pains and low back ache, obesity, Stress and digestive problems of the respondents. The general awareness level about the benefits of yoga were low. CONCLUSIONS: The observed favorable effects of yoga on all the said variables needs to be substantiated by more rigorous studies. However much needs to be done to create awareness as well to include yoga as a complementary as well as preventive therapy for most chronic diseases.

KEYWORDS: Yoga, Regular practice, Awareness, Health benefits, chronic diseases.
pertaining to sleep onset, maintenance and early morning awakening was used to measure insomnia. Perceived Stress Scale by Sheldon Cohen ranging from 0 to 4 was used for measuring stress. Rest symptoms were subjective to the individuals. Complete confidentiality was maintained regarding the identity of the individual.

Data was collected in the month of July 2013 and upto December 2013 from all the individuals on both occasions. The centers were visited twice daily for a period of 15 days to include maximum number of participants. Only those found to practice regularly were administered the questionnaire. Several studies have shown that a period of 12 weeks of continuous yoga brings about a marked difference in the health profile of the individual and hence the study period was taken as 3 months. Data analysis was done using epi info. Variables were presented as frequencies and percentages. Chi square was used to test for significant associations.

Inclusion Criteria:
- Respondents practicing regular yoga (ie 1 hour of yoga daily for at least 5 days a week)
- Willing to share their medical details.

Exclusion Criteria:
- < 18 years of age
- Not doing regular practice of yoga
- Respondents found on only one occasion after 3 days of continuous visit
- Not willing to participate in the study.

RESULTS: Sociodemographic characteristics of respondents.

Age of the respondents ranged from 18 to 79 years with a mean of 35.4+ 15.10 years. The majority (82.9) were less than 47 years old, males (65.8) and singles (47.1%). Two thirds of respondents (67.6%) had atleast secondary education.

The sociodemographic charactereristics are represented in table 1.

| Age group | No. of respondents |
|-----------|--------------------|
| 18-26     | 118 (31.0)         |
| 27-35     | 127 (33.4)         |
| 36-44     | 49 (12.9)          |
| 45-53     | 35 (9.2)           |
| 54-62     | 20 (5.3)           |
| 63+       | 31 (8.2)           |

| Gender | No. of respondents |
|--------|--------------------|
| Males  | 250 (65.9)         |
| Female | 130 (34.2)         |

| Marital status | No. of respondents |
|----------------|--------------------|
| Currently married | 160 (42.1) |
| Widowed & separated | 41 (10.8) |
| Single           | 179 (47.1)        |
Table 2 represents the awareness regarding the benefits of regular practice of Yoga. 196 (51.6%) of the respondents were aware of the benefits of yoga. Among the younger age group <44 years were more aware 59.9% whereas in >44 years only 30.3% were aware of the benefits. Chi square was 35.7, p < 0.001 which is significant.

Not much difference was noted among the males and females 56% and 43.1%. The chi square was 5.71, p <.02 which is statistically significant.

Separated, single and widowed were more aware 127 (57.7%) compared to currently married couples which was 69 (43.1%).

Chi square value 10.8, p <.001 which is again significant.

Secondary and above educated respondents were more aware 161 (62.6%). Chi square value is 38.8, p <.001 which is highly significant.

Looking at the occupation of the respondents 105 (71.9%) business people were more aware compared to job holders 60 (49.2%) or even students and housewives 31 (27.7%)

Respondents aware of 3 or more benefits were considered as being aware of the benefits of yoga.

| Occupation          | Aware (n=196) | Unaware(n=184) |
|---------------------|--------------|----------------|
| Job holders         | 122(32.1)    |                |
| Business            | 146(38.4)    |                |
| Students & housewife| 112(29.5)    |                |

| Education           | Aware (n=196) | Unaware(n=184) |
|---------------------|--------------|----------------|
| Illiterate          | 08(2.1)      |                |
| Primary             | 115(30.3)    |                |
| Secondary           | 101(26.6)    |                |
| Above               | 156(41.1)    |                |

Table 1

1. Age group
   - <44 years: 176 (59.9) Aware, 118 (40) Unaware
   - >44 years: 20 (30.3) Aware, 66 (76.7) Unaware

2. Gender
   - Males: 140 (56) Aware, 110 (44) Unaware
   - Females: 56 (43.1) Aware, 74 (56.9) Unaware

3. Marital status
   - Currently married: 69 (43.1) Aware, 91 (56.9) Unaware
   - Single, widowed & separated: 127 (57.7) Aware, 93 (42.3) Unaware

4. Education
   - Secondary and above: 69 (43.1) Aware, 91 (56.9) Unaware
   - Below secondary: 35 (28.5) Aware, 88 (71.5) Unaware

5. Occupation
   - Business: 105 (71.9) Aware, 41 (28.1) Unaware
   - Jobholders: 60 (49.2) Aware, 62 (50.8) Unaware
   - Students & housewives: 31 (27.7) Aware, 81 (72.3) Unaware

Table 2: Awareness Regarding the Benefits of Yoga
Health problems as in Table 3 shows 252(66.3%) of the respondents suffered from low backache or joint pains of varying degrees of severity. 220(57.9%) had either cardiac or respiratory ailments.

257(67.6%) had either difficulty in falling asleep or were unable to sleep for more than 4 hours at a stretch. A small group 123 (32.4%) had a feeling of general unwell or felt stressed out with their routine work. 160(42.1%) of them were overweight. Wt. more than 10% of the expected was taken as overweight. 28(33.7%) had digestive problems which included constipation and acid peptic disorders.

| Health problem                  | Males (n=250) | Females (n=130) | Total (n=380) |
|--------------------------------|---------------|-----------------|---------------|
| Joint pains & Low back ache     | 149           | 103             | 252 (66.3)    |
| Respiratory & cardiac diseases  | 137           | 83              | 220 (57.9)    |
| Obesity                        | 70            | 90              | 160 (42.1)    |
| Digestive problems             | 163           | 94              | 128 (33.7)    |
| Insomnia                       | 96            | 32              | 257 (67.6)    |
| General unwell & stressed      | 96            | 27              | 123 (32.4)    |

Table 3: Respondents health problems at the beginning of yoga sessions

| Health problems                  | Improved | Not improved | Total | Chi square | P value |
|----------------------------------|----------|--------------|-------|------------|---------|
| Joint & low backache             | 140      | 112          | 252   | 4.74       | 0.029   |
| Respiratory & Cardiac Problem    | 127      | 93           | 220   | 4          | 0.249   |
| Overweight                       | 69       | 91           | 160   | 38.9       | 0.001   |
| Insomnia & stress               | 56       | 72           | 128   | 7.91       | 0.005   |
| Digestive problems              | 161      | 96           | 257   | 1.33       | 0.001   |
| General Wellness                 | 35       | 88           | 123   | 35.7       |         |

Table 4: Outcome of the health problems after 3 months of regular yoga practice

The benefits of yoga of the respondents were noted depending on their medical reports, tests and examinations conducted and their subjective feeling. There was significant improvement in the respondents musculoskeletal problems of joint pains and low back ache, chi square 4.74 p<0.02.
A significant reduction of weight of the respondents, chi square 38.9 \( p<0.001 \). Improvement in digestive problems also showed a significant change, chi square 1.33 \( p<0.001 \). Relieved of the feeling of stress and sleep disturbance also showed a significant improvement, chi square 7.91 \( p<0.005 \). Feeling of overall wellbeing was lower. Only 20.5\% of the respondents had a better feeling at the end of three months of regular yoga practice.

**DISCUSSION:** The practice of yoga has long been in existence worldwide and its practice continues to increase both in developed and developing countries. The prevalence of Non Communicable is also on an increase in developing countries. The practice of Yoga does have a beneficial effect if practiced along with conventional medical treatment.

In the present study there was a significant improvement in the musculoskeletal pains of the back and joints of the respondents (55.5\%) chi square 4.74 and \( p \) value 0.029. The findings of a study conducted by Kimberly Williams, Lois Stienberg and John Petronis in 2003\[1\] show a decrease of 68\% in low backache patients.

Yoga based lifestyle modifications helped regression of coronary artery disease and improvement in myocardial perfusion in a prospective study conducted by Yogendra J et al in 2004\[2\].

Yoga increases regression and retards progression of atherosclerosis in patients with cardiac disorders as shown by a randomized control trial conducted by Bijlani RL et al in 2005\[3\] on patients of proved coronary heart diseases by angiography who practiced yoga for a period of 1 year. These patients showed decrease in the number of angina attacks, improve exercise capacity and decrease in body weight.

The present study also shows a finding of 57.7\% of the respondents showing improvement in their cardiorespiratory symptoms and also an improvement in their total cholesterol and lipid profile levels. The chi square results of this study was not significant.

There is a vast difference in the results of total cholesterol and lipid profile of the following studies. A study by Balaji PA, Smitha VR and Sadat AS in 2011\[4\] shows a significant reduction of total cholesterol, triglyceride and LDL level but non-significant change in HDL level. Study of Singh S et al in 2008\[5\] and Bijlani RL in 2005\[3\] shows a reduction in free fatty acids LDL, VLDL and a rise in HDL levels. Malhotra V et al in 2004\[6\] found a non-significant but lowering of LDL, VLDL and Triglyceride with 40 days of yoga practice.

Yoga significantly improves the respiratory functions and reduces the use of medications as shown in the study conducted by Reddy TP in 2010\[7\]. Bronchial asthma patients also show a reduction in the number of attacks and use of medication as found by Bijlani RL in 2005\[3\]. Fulambark A et al\[8\] also found at Yoga has a positive effect on COPD patients.

Obesity and even overweight is a risk factor for almost all chronic diseases which can be easily managed without medical intervention also. The present study shows a significant reduction chi square 38.9 and \( p \) value 0.001 of 10\% of the extra weight of the respondents. Yoga for 1 hour in the morning for 3 months resulted in decrease in BMI and waist hip ratio in a study by Balaji PA, Smitha VR and Sadat AS in 2011\[9\].

The present study shows a significant reduction chi square 7.91 and \( p \) value 0.005 in stress level and problems of insomnia. A study conducted by Michalsen A et al in 2005\[10\] and west J et al in 2004\[11\] also showed the positive effects of yoga on stress. Nagarathna Ret al in 2012\[12\] found a significant reduction in BMI and stress.
Digestive problems were also found to be significantly improved after 3 months of regular yoga practice in this study chi square 1.33 p value0.001. Yoga can relieve stress and hence the digestive ailments.

The present study could find that the overall feeling of unwell which was found in 123(32.4%) of the respondents showed only a improvement by 28.5%. The cause for the unwell feeling which is a vague symptom needs to be investigated in detail. Though studies regarding various system ailments are there no study regarding general well-being could be found.

CONCLUSIONS: As per this study the practice of yoga is more common in younger age group <=44 years though non communicable diseases increase with increasing age. Awareness level regarding the benefits are also less. Not many educated people know about the benefits. This study also concludes that businessmen have a better knowledge regarding the benefits than job holders. More awareness has to be created through various mass media regarding the usefulness of yoga as age advances. The results of this study also indicate that there is also a significant improvement in most of the ailments when the respondent has practiced yoga regularly for a period of three months. It may be possible to have still better results i.e. delay the onset of non-communicable diseases if the practice of yoga is started at younger age and done routinely. Yoga has to be done under the supervision of a trained instructor only.

The observed favorable effects of yoga on all the said variables needs to be substantiated by more rigorous studies.

However much needs to be done to create awareness as well to include yoga as a complementary as well as preventive therapy for most non-communicable diseases.

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REFERENCES:
1. Williams K, Lois Steinberg John Petronis. Therapeutic application of Iyengar yoga for healing low back ache International journal of yoga therapy 2003 No 13 55.
2. Yogendra J, Yogendra HJ, Ambardekar S, Lele RD, Shetty S, Dave M, et al. Beneficial effects of yoga lifestyle on reversibility of ischaemic heart disease: Caring heart project of International Board of Yoga. J Assoc Physicians India 2004; 52: 283-9.
3. Bijlani RL, Vempati RP, Yadav RK, Ray KB, Gupta V, Sharma R, et al. A brief but comprehensive lifestyle education program based on yoga reduces risk factors for cardiovascular disease and diabetes mellitus. J Altern Complement Med 2005; 11: 267-74.
4. Balaji PA, Smitha VR, Sadat AS. Effects of yoga - pranayama practices on metabolic parameters and anthropometry in type 2 diabetes. Int Multidiscip Res J 2011; 1: 1-4.
5. Singh S, Kyizom T, Singh KP, Tandon OP, Madhu SV. Influence of pranayamas and yoga-asanas on serum insulin, blood glucose and lipid profile in type 2 diabetes. Indian J Clin Biochem 2008; 23: 365-8.
6. Malhotra V, Singh S, Singh KP, Madhu SV, P Gupta, Tandon OP. Effects of yoga asanas and pranayama in non-insulin dependent diabetes mellitus. Indian J Tradit Knowl 2004; 3: 162-7.
7. Reddy TP. Effect of yoga training on handgrip, respiratory pressures and pulmonary function. Br J Sports Med. 2010; 44: i68.
8. Fulambarker A, Farooki B, Kheir F, Copur AS, Srinivasan L, Schultz S. Effect of yoga in chronic obstructive pulmonary disease. Am J Ther 2012; 19: 96-100.
9. Michalsen A, Grossman P, Acil A, Langhorst J, Ludtke R, Esch T, et al. Rapid stress reduction and anxiolysis among distressed women as a consequence of a three month intensive yoga program. Med Sci Monit 2005; 11: 555-61.
10. West J, Otte C, Geher K, Johnson J, Mohr DC. Effects of Hatha yoga and African dance on perceived stress, affect, and salivary cortisol. Ann Behav Med 2004; 28: 114-8.
11. Nagarathna, R., Usharani, M. R., A. Raghavendra Rao, Chaku, R., Kulkarni, R., and Nagendra, H. R. (2012). Efficacy of yoga based life style modification program on medication score and lipid profile in type 2 diabetes-a randomized control study. International Journal of Diabetes in Developing Countries, 32(3): 122-130.
12. Anand MP. Non-pharmacological management of essential hypertension. J Indian Med Assoc 1999; 97: 220-5.
13. Barnes PM, Bloom B, Nahin RL. Complementary and alternative medicine use among adults and children: United States, 2007. CDC National Health Statistics Report #12. 2008.
14. Bhavanani AB, Sanjay Z, Madanmohan. Immediate effect of sukha pranayama on cardiovascular variables in patients of hypertension. Int J Yoga Therap 2011; 21: 73-6.
15. Birdee GS, Legedza AT, Saper RB, et al. Characteristics of yoga users: results of a national survey. Journal of General Internal Medicine. 2008; 23(10): 1653–1658.
16. Bureau of Labor Statistics. U.S. Department of Labor. Occupational Outlook Handbook, 2010–11 Edition: Fitness Workers. Bureau of Labor Statistics Web site. Accessed at http://www.bls.gov/ooh/personal-care-and-service/fitness-trainers-and-instructors.htm on January 24, 2012.
17. Canter PH. The therapeutic effects of meditation. BMJ 2003; 326:1049-50. [PUBMED].
18. Davendra Kumar Taneja Yoga and health Indian journal of Community medicine April – June: 39 (2); 68-72.
19. Ebnezar, J., Nagarathna, R., Yogitha, B., and Nagendra, H. R. (2012). Effect of integrated yoga therapy on pain, morning stiffness and anxiety in osteoarthritis of the knee joint: A randomized control study. International Journal of Yoga, 5(1): 28-36.
20. Jain SC, Talukdar B. Role of yoga in middle aged patients of non-insulin dependent diabetes mellitus. Indian J Clin Biochem 1995; 10: 62-5.
21. Kiecolt-Glaser JK, Christian L, Preston H, et al. Stress, inflammation, and yoga practice. Psychosomatic Medicine. 2010; 72(2): 113–121.
22. Kirkwood G, Rampes H, Tuffrey V, Richardson J, Pilkinson K. Yoga for anxiety: A systematic review of the research evidence. Br J Sports Med 2005; 39: 884-91.
23. Kyizom T, Singh S, Singh KP, Tandon OP, Kumar R. Effect of pranayama and yoga-asana on cognitive brain functions in type 2 diabetes-P3 event related evoked potential (ERP). Indian J Med Res 2010; 131: 636-40.
24. Lipton L. Using yoga to treat disease: an evidence-based review. JAAPA. 2008; 21(2): 34–36, 38, 41.
25. Manchanda SC, Narang R, Reddy KS, Sachdeva U, Prabhakaran D, Dharmanand S, et al. Retardation of coronary atherosclerosis with yoga lifestyle intervention. J Assoc Physicians India 2000; 48: 687-94.

26. Murugesan R, Govindarajalu N, Bera TK. Effect of selected yogic practices in the management of hypertension. Indian J Physiol Pharmacol 2000; 44: 207-10.

27. Oken BS, Zajdel D, Kishiymama S, et al. Randomized, controlled, six-month trial of yoga in healthy seniors: effects on cognition and quality of life. Alternative Therapies in Health and Medicine. 2006; 12(1): 40-47.

28. Pilkington K, Kirkwood G, Rampes H, Richardson J. Yoga for Depression: The research evidence. J Affect Disord 2005; 89: 13-24.

29. Raghavendra, B. R., Telles, S., Manjunath, N. K., Deepak, K. K., Naveen, K. V., and Subramanya P. (2012). Voluntary heart rate reduction following yoga using different strategies. International Journal of Yoga, in press.

30. Rangan, R., Nagendra, H. R., and Bhat, R. (2009). Effect of yogic education system and modern education system on sustained attention. International Journal of Yoga, 2(1): 35-38.

31. Raub, JA. Psychophysioologic effects of hatha yoga on musculoskeletal and cardiopulmonary function: a literature review. The Journal of Alternative and Complementary Medicine. 2002; 8(6): 797–812.

32. Ross A, Thomas S. The health benefits of yoga and exercise: a review of comparison studies. Journal of Alternative and Complementary Medicine. 2010; 16(1): 3–12.

33. Santaella DF, Devesa CR, Rojo MR, Amato MB, Drager LF, Casali KR, et al. Yoga respiratory training improves respiratory function and cardiac sympathovagal balance in elderly subjects: A randomised controlled trial. BMJ Open 2011; 1: e000085.

34. Selvamurthy W, Sridharan K, Ray US, Tiwary RS, Hedge KS, Radhakrishnan U, et al. A new physiological approach to control essential hypertension. Indian J Physiol Pharmacol 1998; 42: 205-13.

35. Shapiro D, Cook IA, Davydov DM, Ottaviani C, Leuchter AF, Abrams M. Yoga as a complementary treatment of depression: Effects of traits and moods on treatment outcome. Evid Based Complement Alternat Med 2007; 4: 493-502.

36. Sherman KJ, Cherkin DC, Wellman RD, et al. A randomized trial comparing yoga, stretching, and a self-care book for chronic low back pain. Archives of Internal Medicine. 2011; 171(22): 2019-2026.

37. Smith C, Hancock H, Blake-Mortimer J, Eckert K. A randomized comparative trial of yoga and relaxation to reduce stress and anxiety. Complement Ther Med 2007; 15: 77-83.

38. Tekur, P., Nagarathna, R., Chametcha, S., Hankey, A., and Nagendra, H. R. (2012). A comprehensive yoga programs improves pain, anxiety and depression in chronic low back pain patients more than exercise: An RCT. Complementary Therapies in Medicine, 20(3): 107-18.

39. Tilbrook HE, Cox H, Hewitt CE, et al. Yoga for chronic low back pain: a randomized trial. Annals of Internal Medicine. 2011; 155(9): 569-578.

40. Traditional yoga and meditation of the Himalayan masters. Available. from: http://www.swamij.com/yoga-sutras-22629.htm [Last accessed on 2013 Dec 1].
41. Uebelacker LA, Epstein-Lubow G, Gaudiano BA, et al. Hatha yoga for depression: a critical review of the evidence for efficacy, plausible mechanisms of action, and directions for future research. Journal of Psychiatric Practice. 2010; 16(1): 22–33.

42. Vempati R, Bijlani RL, Deepak KK. The efficacy of a comprehensive lifestyle modification programme based on yoga in the management of bronchial asthma: A randomized controlled trial. BMC Pulm Med 2009; 9: 37.

43. Williams K, Abildso C, Steinberg L, et al. Evaluation of the effectiveness and efficacy of Iyengar yoga therapy on chronic low back pain. Spine. 2009; 34(19): 2066–2076.

44. Wren AA, Wright MA, Carson JW, et al. Yoga for persistent pain: new findings and directions for an ancient practice. Pain. 2011; 152(3): 477–480.

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