

**EFFECTS OF SUDARSHAN KRIYA ON STRESS REDUCTION IN GENERAL POPULATION**

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**ABSTRACT****BACKGROUND**

Stress, depression and anxiety have a yearly prevalence of 10 to 20% in the general population. All factors that cause one's conditions to diverge too far from the normal homeostasis lead to stress. Our attempts to restore the condition back to homeostasis also leads to stress. Stress affects quality of life by affecting the factors like level of unhappiness, focus, sleep disturbances, anger, frustration etc., because while responding to stress the sympathetic nervous system becomes active. Asthma, headache, IBS, anxiety and ulcers are the commonest presentations in stressful people. Various methods are studied in literature to relieve stress like exercise, walking, pranayam, meditation, gym, music and games. Sudarshan Kriya (SK) claims to have wide and varied effects on human body in different aspects. SK stimulates vagal response and counterbalances the effects of stress.

**MATERIALS AND METHODS**

This is a cohort study with group comparison of subjects regularly practicing SK for more than 6 months. Age matched controls used other Stress Releasing Measure (SRM) like walking, pranayam and gym with ethical standards. Data collection was done by close-ended questionnaire using Likert score for comparison of parameters.

Statistical Analysis- The data were entered into the computer and analysed by using the Statistical Package for Social Sciences (SPSS) version 10.0 programs for Windows. Unpaired student's t-test, the mean and SD was calculated. The significant value was achieved at  $p < 0.05$ .

**RESULTS**

The selected population faced equal challenges in life. Stress created equal impact in the controls and study subjects. Although, the controls have shown a definite improvement in the quality of life after using stress releasing measures. But, the study shows that controls feel more stressed than SK doers ( $p$  was significant at 0.02). The regular SK doers are more focussed with a positive outlook. Categorically (Qualitatively), there was a significant shift towards Likert score of 5 in the SK doers ( $p= 0.002$ ). SK doers significantly surpassed the control group by scoring highest on Likert scale in almost every parameter studied, e.g. levels of happiness, focus, sleep patterns, anger, frustration, outlook, habits of consuming alcohol, gutka, tobacco and even medical problems. Thus, life appears eased out in regular kriya doers.

**CONCLUSION**

SK relieves stress in general population in a very significant manner when compared with other stress releasing measures. SK has an extremely positive effect on physical and mental health of the general population. It can definitely be recommended as a highly beneficial, no risk, low cost option to take care of stress and its effects on the human body.

**KEY WORDS**

Stress, Anxiety, Depression, Sudarshan Kriya, Stress Releasing Measures.

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**BACKGROUND**

Stress is a response to a stressor. It is rather a method of reacting to a challenge. Stress, depression and anxiety have a yearly prevalence of 10 to 20% in the general population.<sup>(1)</sup> All factors that cause one's condition to diverge too far from the normal homeostasis lead to stress. Our attempts to restore the condition back to homeostasis also leads to stress. In such conditions, the flight/ fight response recruits the

energy stores and focuses the attention to overcome the challenges at hand. Stress affects quality of life by affecting the factors like level of unhappiness, focus, sleep disturbances, anger, frustration etc., because while responding to stress the sympathetic nervous system becomes active. Sympathetic nervous system regulates the body's physiological function to make the body adaptive to environment. Brain plays an important role in perceiving the response to stress. Asthma, headache, IBS, anxiety and ulcers are the commonest presentations in stressful people.<sup>(2-9)</sup> Stress is widely prevalent in all sections/ strata of society. Various methods are studied in literature to relieve stress. Exercise, walking, pranayam, meditation, gym, music, games and Sudarshan Kriya (SK) has a positive effect on physical and mental health. SK claims to have wide and varied effects on human body in different aspects.<sup>(8-20)</sup> The vagus nerve is the single most relevant organ in our body relative to our peace of mind and happiness. Research indicates that a

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healthy vagus nerve is vital in experiencing empathy and fostering social bonding and it is crucial to our ability to observe, perceive and make complex decisions. Tests have revealed that people with impaired vagal activity have also been diagnosed with depression, panic disorders, post-traumatic stress disorders, irritable bowel syndrome, anxiety and mood swings. The powerful breathing technique that naturally stimulates the vagus nerve is called "The Sudarshan Kriya." Scientists have found that Sudarshan Kriya and Pranayama (SK along with related practices of yogic asanas, pranayama, nadi shodhan and meditation) can be extremely effective in opening up this vital channel of energy.<sup>(21)</sup>

**Hypothesis**

Can Sudarshan Kriya be useful in reducing stress and its effects in general population?

**MATERIALS AND METHODS**

This is a cohort study. The procedure followed is in accordance with ethical standards. Informed consent from the study participants was sought. Age matched controls used other Stress Releasing Measure (SRM) like walking, pranayam, gym with ethical standards, data collection done by close ended questionnaire using Likert's score for comparison of parameters. They were selected by convenience sampling technique.

**Inclusion Criteria**

Study subjects were people between 20 and 45 yrs., who were exclusively practicing SK regularly for more than 6 months. Controls were age matched persons from the same population who were using other methods of relaxation and health like walking, pranayam, music and gym.

**Selection of Controls**

Age matched controls who were routinely and regularly performing other exercises like walking, gym, music, games, meditation and pranayam were selected from the same community/ area for which SK subjects were selected.

**Exclusion Criteria**

Persons doing relaxation techniques from a long time, but now having a gap of more than 7 days so that the effects wane off and those who refused consent to participate in the study.

**Data Collection**

A close-ended questionnaire using Likert's score was used and information on the study variables, stress parameters and socio-demographics of individual study subjects was recorded.

Data was summarised by mean, Standard Deviation (SD), frequencies and percentages.

A 'p' value less than 0.05 was considered statistically significant.

**Statistical Analysis**

The data were entered into the computer and analysed by using the Statistical Package for Social Sciences (SPSS) version 10.0 programs for Windows. Unpaired student's t-test, the means and SD was calculated. The significance value was achieved at  $p < 0.05$ .

**RESULTS**

When asked "are you happy in life?" SK doers strongly agreed and showed a high Likert's score than the controls. Study by convenient sampling technique since the duration of the study was 6 months. They were selected by convenience sampling technique. The cause of unhappiness was found to be friends/ relatives in the controls, while for SK doers it was one's outlook and own-self ( $p= 0.03$  significant). Both groups agreed that life is a challenge.

Both groups faced challenges equally ( $p= 0.77$ , non-significant), but stress had more impact in controls than in SK doers ( $p= 0.02$ ). Thus, life appears eased out in Kriya doers.

When compared for symptoms due to challenges and stress, stress produced similar symptoms in both the groups (as suggested by non-significant p-value for all symptom parameters, e.g. asthma, headache, IBS, anxiety).

When effects of stress releasing methods were compared in two groups, the results were remarkable in SK doers, as is seen in Table 1 below. A significant reduction in mean stress scores was obtained for most of the parameters, except anger and frustration where quantitative estimation did not show any significant difference.

Stress	Study Group (n=100)		Control Group (n=100)		Difference in Change		P-value	Significance of Difference
Symptoms	Mean Change	SD Change	Mean Change	SD Change	Mean Difference	SD Difference		
Levels of Happiness	1.1	1.9	0.32	1.6	0.78	1.79	0.0019	Highly Significant
Focus	1.05	1.79	0.45	1.54	0.6	1.69	0.0118	Significant
Sleep Pattern	1.05	1.99	0.27	1.54	0.78	1.82	0.0022	Highly Significant
Frustration	0.62	1.87	0.57	1.65	0.05	1.76	0.8413	Not Significant
Anger	0.41	2	0.23	1.87	0.18	1.93	0.5117	Not Significant
Change in Outlook	1.32	1.5	0.19	1.97	1, 13	1, 83	0.0001	Highly Significant
Consumption of Alcohol/Tobacco/Cigars	2.99	1.18	1.92	0, 79	1.07	1.14	0.0001	Highly Significant
Medical Problems	4.32	1.67	4	1, 67	0.32	1.67	0.177	Not Significant

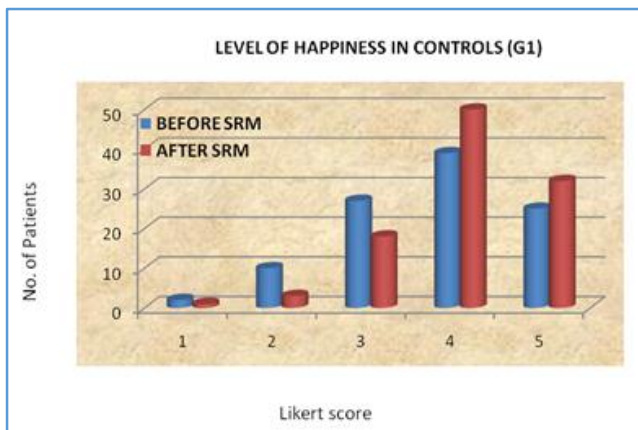
**Table 1. Change in Mean Scores by symptoms in Two Comparison Groups (Quantitative Estimation)**

However, categorical estimation for all of the study parameters (Table 2 onwards) was found to be significant as follows:

Table 2- Levels of happiness: A significant shift towards Likert's 5 in SK doers (p= 0.002). Most of the SK doers are frequently happy now.

Likert's Score	Before SRM	After SRM
1 (never)	2	1
2 (rarely)	10	3
3 (occasionally)	27	18
4 (frequently)	39	50
5 (very frequently)	25	32

**Table 2(A). Levels of Happiness in Controls (G1)**



Likert's Score	Before SRM	After SRM
1 (never)	3	0
2 (rarely)	19	1
3 (occasionally)	36	8
4 (frequently)	25	33
5 (very frequently)	21	62

**Table 2(B). Levels of Happiness in Subjects (G2)**

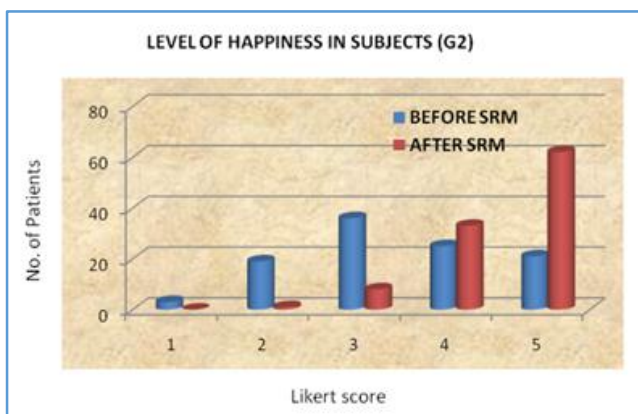
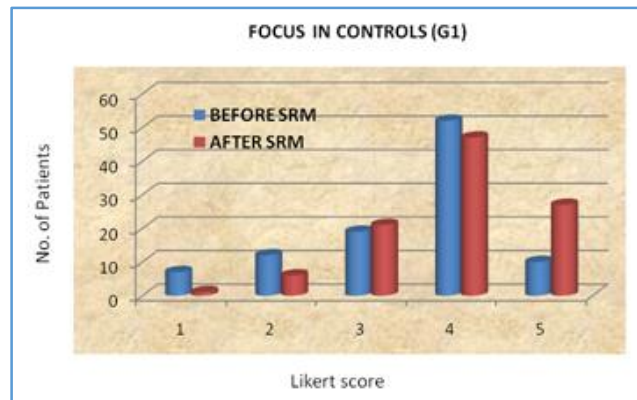


Table 3- Focus: Focus improved significantly when SK was used to relieve stress (p= 0.03).

Likert's Score	Before SRM	After SRM
1 (never)	7	1
2 (rarely)	12	6
3 (occasionally)	19	21
4 (frequently)	52	47
5 (very frequently)	10	27

**Table 3(A). Focus in Controls (G1)**



Likert's Score	Before SRM	After SRM
1 (never)	7	2
2 (rarely)	18	0
3 (occasionally)	37	9
4 (frequently)	25	50
5 (very frequently)	15	44

**Table 3(B). Focus in Subjects (G2)**

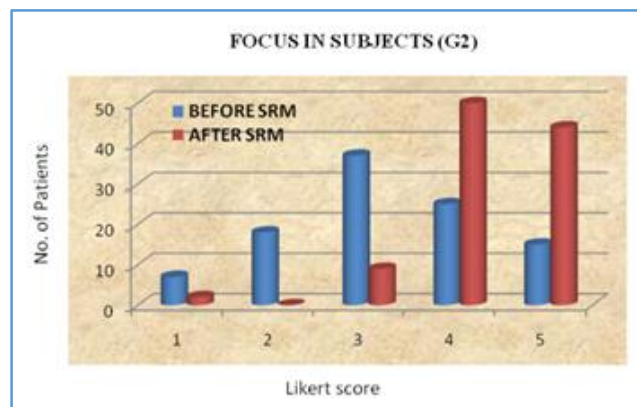
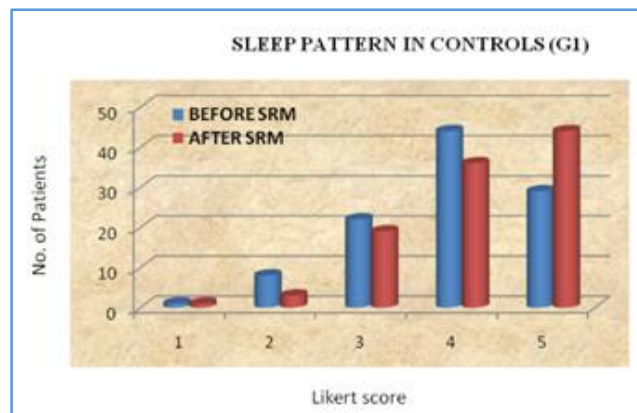


Table 4- Sleep Pattern: Controls show some improvement after using stress releasing measures. SK doers show a highly significant improvement in sleep pattern with majority having highest score on Likert's, giving a significant value (p=0.04).

Likert's Score	Before SRM	After SRM
1 (never)	1	1
2 (rarely)	8	3
3 (occasionally)	22	19
4 (frequently)	44	36
5 (very frequently)	29	44

**Table 4(A). Sleep in Controls (G1)**



Likert's Score	Before SRM	After SRM
1 (never)	2	0
2 (rarely)	12	1
3 (occasionally)	23	7
4 (frequently)	37	39
5 (very frequently)	24	58

**Table 4(B). Sleep in Subjects (G2)**

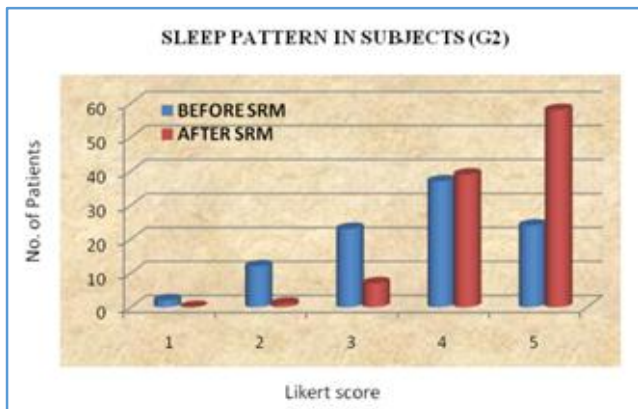
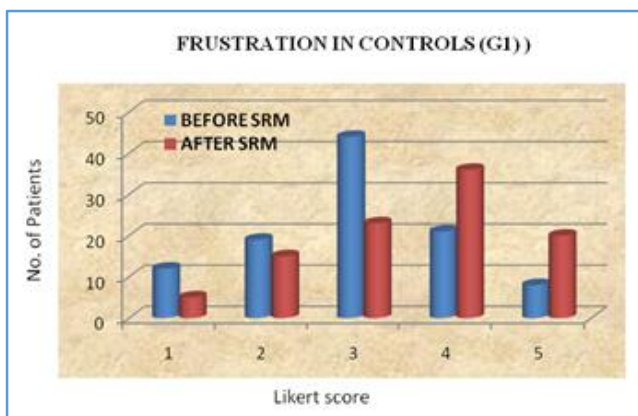


Table 5- Frustration: Although frustration was reduced in both, but SK does give highest Likert's score (p= 0.00).

Likert's Score	Before SRM	After SRM
1 (very frequently)	12	5
2 (frequently)	19	15
3 (occasionally)	44	23
4 (rarely)	21	36
5 (never)	8	20

**Table 5(A). Frustration in Controls (G1)**



Likert's Score	Before SRM	After SRM
1 (very frequently)	6	2
2 (frequently)	15	7
3 (occasionally)	20	11
4 (rarely)	41	34
5 (never)	23	51

**Table 5(B). Frustration in Subjects (G2)**

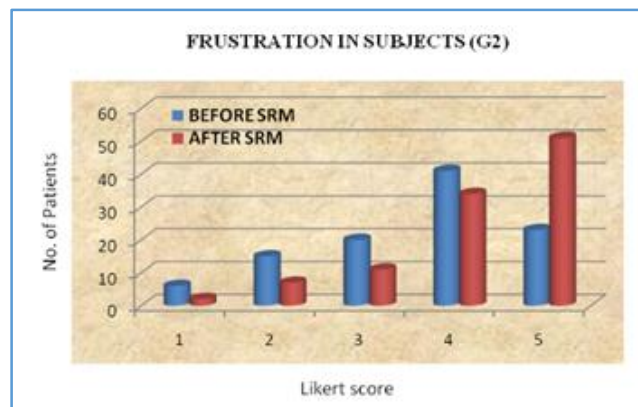
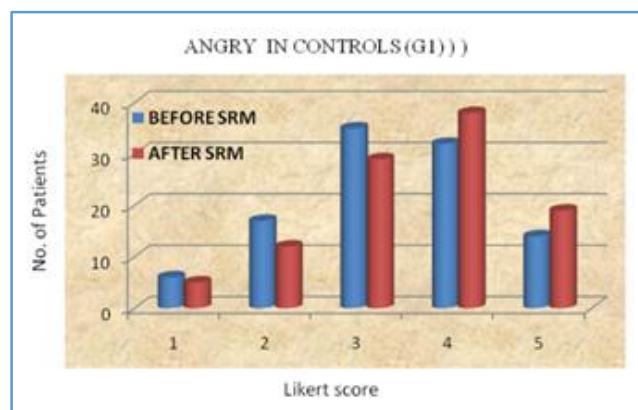


Table 6- Anger: After using relaxing methods anger has reduced in the controls, but in SK does the scores of reduced anger are highest on Likert's scale, (p= 0.005).

Likert's Score	Before SRM	After SRM
1 (very frequently)	6	5
2 (frequently)	17	12
3 (occasionally)	35	29
4 (rarely)	32	38
5 (never)	14	19

**Table 6(A). Anger in Controls (G1)**



Likert's Score	Before SRM	After SRM
1 (very frequently)	5	1
2 (frequently)	16	8
3 (occasionally)	16	16
4 (rarely)	40	36
5 (never)	28	43

**Table 6(B). Anger in Subjects (G2)**

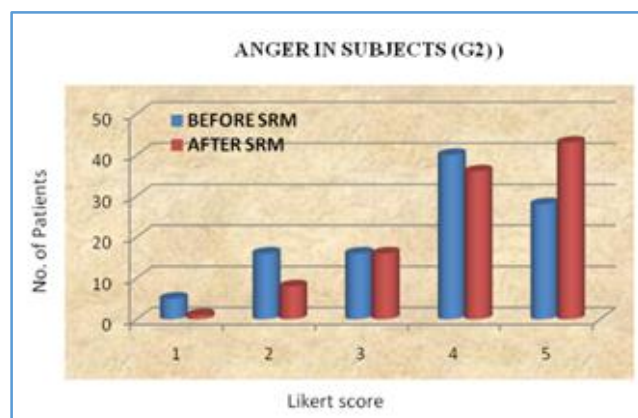
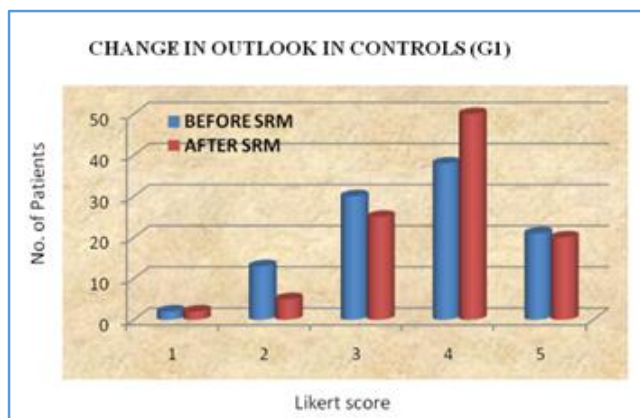
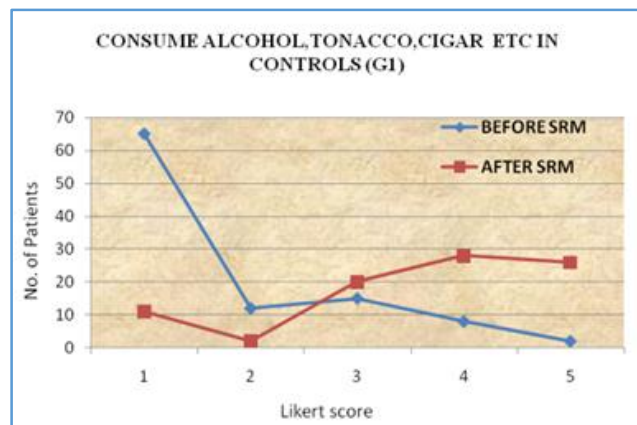


Table 7- Change in outlook: Improvement was statistically significant in SK doers, once again showing score on higher side of the Likert's scale (p= 0.00).

Likert's Score	Before SRM	After SRM
1 (strongly negative)	2	2
2 (some negative change)	13	5
3 (neutral)	30	25
4 (some positive change)	38	50
5 (strongly positive)	21	20

**Table 7(A). Change in outlook in Controls (G1)**



Likert's Score	Before SRM	After SRM
1 (very frequently)	82	2
2 (frequently)	10	1
3 (occasionally)	9	14
4 (rarely)	2	22
5 (never)	1	57

**Table 8(B). Consume Alcohol, Tobacco, Cigar etc. in Subjects (G2)**

Likert's Score	Before SRM	After SRM
1 (strongly negative)	13	1
2 (some negative change)	17	2
3 (neutral)	35	7
4 (some positive change)	23	35
5 (strongly positive)	16	60

**Table 7(B). Change in outlook in Subjects (G2)**

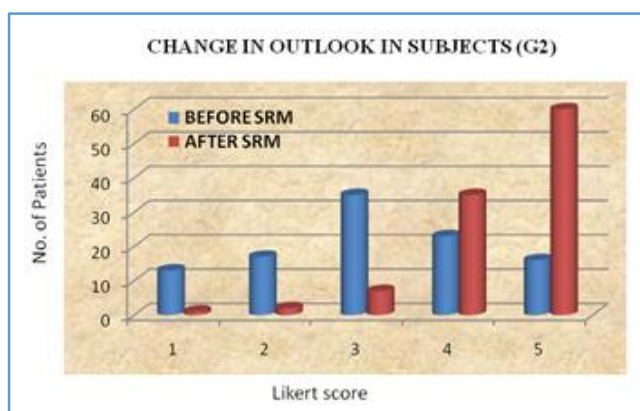
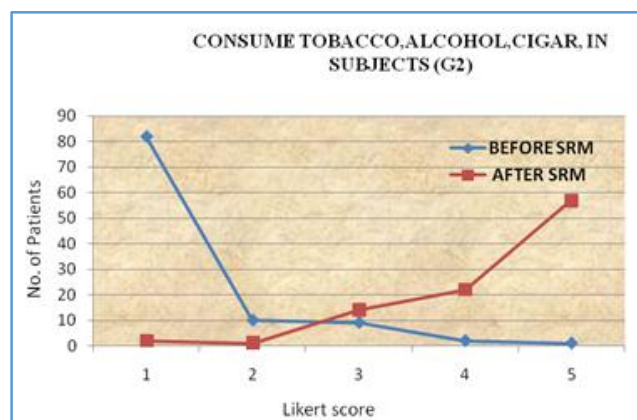


Table 8- Consumption of alcohol, tobacco, cigars: Consumption was low in both the groups.

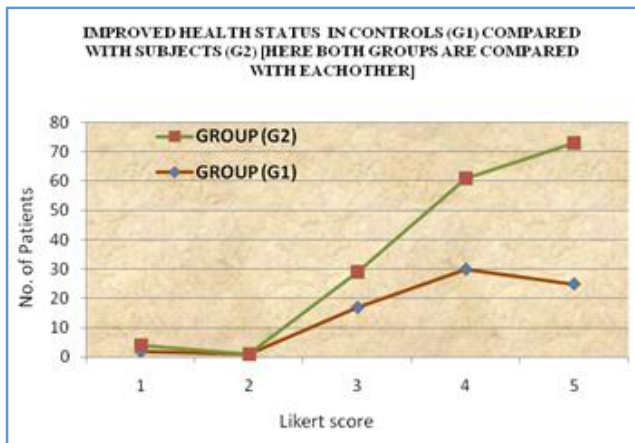
Likert's Score	Before SRM	After SRM
1 (very frequently)	65	11
2 (frequently)	12	2
3 (occasionally)	15	20
4 (rarely)	8	28
5 (never)	2	26

**Table 8(A). Consume Alcohol, Tobacco, Cigar etc. in Controls (G1)**

Table 9- Medical problems: Population being between 20 and 45 years, the frequency of occurrence of medical problems was less. The subjects had strongly agreed for a favourable change in health status after regular practice of SK.

Likert's Score	Controls (G1)	Subjects (G2)
1 (strongly disagree)	2	2
2 (disagree)	1	0
3 (undecided)	17	12
4 (agree)	30	31
5 (strongly agree)	25	48

**Table 9. Improved Health Status in Controls (G1) compared with Subjects (G2)**



## DISCUSSION

When in stress the body reacts by release of chemicals in blood. These chemicals help us to cope in different situations.

Every human being wants to be happy, whether it is money, power or materialistic possessions, all we want is for sake of happiness.

Studies have shown that those who stick themselves to long-term yoga practice report themselves to be happier and healthier. Although, you can do breathing exercises without yoga, but pairing yoga and breathing exercises together is a guaranteed happiness booster.<sup>(22)</sup>

The first and foremost fundamental responsibility for a human being is to become a joyous being. Only if you are happy can other great possibilities open up.<sup>(23)</sup>

HH Sri Sri Ravishankarji says that life is 80% joy and 20% misery, yet we hold onto 20% and make it 200%. This is not a conscious act, but it just happens. Living in the moment with joy, alertness, awareness and compassion is enlightenment.<sup>(13)</sup>

In the present study, we have done both quantitative and categorical evaluation of stress parameters. Quantitatively, a significant reduction was observed (i.e. before and after change) in mean stress scores for most of the parameters in both the groups, but anger and frustration were the two parameters where the change was not found to be significant in the two groups.

However, categorical evaluation yielded significant p values for all the parameters including anger and frustration as seen in Tables 5 and 6.

Categorically (Qualitatively) a significant shift towards Likert's score 5 in the SK doers ( $p=0.002$ ) meant that most of the SK doers find themselves more frequently happy now.

In this study, we found that the control group attributes the cause of their unhappiness due to their jobs, business, friends etc. Thus, they depend on the improvement of the status of these factors, which are not in their control. On the other hand, the SK doers attribute the cause of unhappiness to their own-self and their outlook. These are the factors where they do not need to depend on others. They can make the necessary improvements in their own-self and make their life happier and more enthusiastic. A difference in outlook in the SK doers has made them happier now.

It was found that challenges created stress in both the groups, but controls felt it more in the present study.

SK doers seem to become somewhat more fearless and confident, thereby changing their approach towards a more

positive one making themselves comparatively happier and less stressful in life.

A wavering focus is a major cause of low productivity at the work place. Yoga and pranayam are the time-tested oldest methods to improve focus. Thus, SK also enhances the brain function.<sup>(24)</sup> The regular SK doers in study have observed a heightened level of awareness and focus.

Literature shows that with SK during sleep three times more time is spent in the deep restful stage of sleep, thus giving an improved quality of sleep.<sup>(25)</sup>

Evidence shows that yoga and mindfulness (bringing one's attention to the experiences occurring in the present moment) can help improve the ability to relax, rest and get a good night's sleep. Decades ago modern medicine and science rarely considered yoga meditation as a part of health care. But in recent years experts in psychology, neuroscience, oncology and other fields have started looking into the potential benefits of these two practices, finding tangible evidence of sleep support.<sup>(26)</sup>

Stress release is an avenue by which mindfulness may support sleep. It can be developed through the practice of meditation and other training.

Frustration has also reduced significantly in regular SK doers in this study.

Stress management and moves to relieve stressful working conditions should be an integral part of any smoking/ drinking cessation programs.<sup>(27)</sup>

A literature browse also shows significant reduction in addictive behaviour after SK.<sup>(28-30)</sup>

Although consumption of alcohol, tobacco and cigar was low in both the groups, a uniform distribution of improvement is seen in controls. In subjects doing regular SK, a sharp rise in the number of people showing improved scores strongly suggests a good control on such habits, as is also indicated by a significant p-value ( $p=0.00$ ) for Pearson's Chi-square ( $df=5$ )= 22.92 obtained here. Thus, early and timely intervention of SRM or SK to reduce stress can prevent habituation of alcohol and smoking.

A study on a larger number of people with consistency in such habits would be required before we can declare that SK can be a means to improve our self-control and enlighten our consciousness to keep us aware and aloof of the unwanted or harmful habits.

Studies have shown that brain GABA levels spike after 1 hour of yoga. High GABA levels are associated with low levels of depression and anxiety.<sup>(22)</sup>

"Psychiatry today on Sudarshan Kriya" (Oct. 05) states in 'a breath of relief for hurricane Katrina refugees' that stress reducing programmes of SK relieved trauma symptoms perhaps by stimulating the vagus nerve.<sup>(31)</sup>

Brown Richard found that there is a sufficient evidence to consider SK to be beneficial, low risk, low cost adjunct to treatment of stress, anxiety, depression, substance abuse and rehabilitation of criminal offenders.

The fact that subjects had strongly agreed of an improved health status after a regular practice of SK is confirmed by the higher scores they show on the Likert's scale.

## Summary

In a selected urban population where adults in both groups faced equal challenges in life creating an equal impact of stress, although the controls have shown a definite

improvement in the quality of life after using stress releasing measures. But the study group clearly shows that controls feel more stressed than SK doers (p was significant at 0.02). The regular SK doers are more confident, fearless and focussed with a positive outlook. SK doers significantly surpassed the control group by scoring highest on Likert's scale in almost every parameter studied, eg. levels of happiness, focus, sleep patterns, anger, frustration, outlook, habits of consuming alcohol, gutka, tobacco and even medical problems. Thus, life appears eased out in regular kriya doers.

### CONCLUSION

SK relieves stress in general population in a very significant manner when compared to other Stress Releasing Measures. SK has an extremely positive effect on physical and mental health of the general population. It can definitely be recommended as a highly beneficial, no risk, low cost option to take care of stress and its harmful effects on the human body.

### Limitation

Evidence on effect of Sudarshan Kriya could have been best established if the study had been done by a Randomised Control Trial (RCT). Hence, study should be replicated on a larger, community-based sample to learn more about the effectiveness of Sudarshan Kriya in general population.

### Implication

When compared with other means of stress release, SK is the only cost-effective means to improve the quality of life to its maximum. "The Magical Sudarshan Kriya."

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