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Short Term Effects of Guided Meditation Isha Kriya on Various Physiological Parameters in Medical Students

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ABSTRACT

Objectives: Medical students often face heightened stress, anxiety, and emotional turmoil while adjusting to a demanding academic environment. Mind-body practices such as guided meditation can support emotional regulation, enhance concentration, and boost self-esteem. This study evaluated the impact of a six-week Isha Kriya guided meditation program on stress and well-being in first- and second-year MBBS students. Methods: A total of 64 MBBS students participated in daily 15-minute Isha Kriya meditation for six weeks. Baseline assessments included pulse rate, blood pressure (systolic and diastolic), the Perceived Stress Scale (PSS), and a Well-Being Index. These parameters were reassessed at the end of the 2nd, 4th, and 6th weeks. Changes from baseline were analyzed using paired t-tests, with a p-value <0.05 considered significant. Results: Post-intervention data showed a statistically significant improvement in well-being and a reduction in stress and pulse rate. The

mean Well-Being Index increased from 62.24 to 75.91 (p = 0.00099). Perceived stress reduced from 0.4495 to 0.3891 (p = 0.005). The pulse rate declined from 92.5 to 83.2 (p = 0.00002). These results suggest a clear benefit of regular guided meditation on mental and physiological health markers. Conclusion: Daily Isha Kriya meditation for six weeks significantly reduced perceived stress and improved well-being and physiological parameters in medical students, highlighting its value as a simple yet effective mind-body intervention.

Keywords: Isha Kriya, Guided Meditation, Well-being, Perceived Stress, Pulse Rate.

INTRODUCTION

Students are exposed to a lot of psychological distress, peer pressure, addiction to mobile, academic overload especially after joining professional course like MBBS. All these factors induce a lot of stress to medical students affecting their well-being both mentally and physically. Chronic stress in students leads to decreased immunity and are prone for various infections. The essence of the definition of health as given by World Health Organisation (WHO) is that, a person having no disease cannot be confirmed as healthy individual. He/she should be well physically, mentally fit and socially active. Based on the World Health Organization (WHO) definition, health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity [1]. Anxiety and depression are the major causes for inducing stress leading to the disability of the adults all over the world [2]. Chronic stress is known to have a powerful impact to derange the physiological activities of not only hypothalamic-pituitary-adrenal axis but also autonomic nervous system [3]. Stress is one of the important factors in decreasing the mental clarity of an individual, who will be more prone to substance abuse in adolescence [4]. Regular practice of meditation leads to holistic health and wellbeing of the individual. The idea of doing meditation is not to have a blank mind but to have a receptive mind which becomes very essential for students to achieve their goals and excel academically. Meditation helps to bring clarity of mind, all-inclusiveness towards humanity which is of utmost importance in medical profession. Meditation improves focus and concentration, because of the cessation of numerous non-stop unwanted thoughts in order to receive and connect with the higher and deeper truths of life [5].

Influence of Isha Kriya, Shambhavi Mahamudra Kriya and other meditation methods have been explored by several researchers in the past. Peterson et al. [6] conducted a three day retreat programme in which 142 individuals (mean age of 43 years) learned Shambhavi Mahamudra Kriya. Every day, participants practiced the Isha Kriya for 21 minutes over a six week duration. Perceived stress levels decreased and well-being levels increased in comparison with the baseline for all the participants. Hence, they suggest that Shambhavi Mahamudra Kriya naturally treats to reduce the stress of an individual.

Rangasamy et al. [7] conducted an interventional study using 15 minute guided mediation (Isha Kriya) on health care professionals (61 surgeons, 101 anethesiologists and 151 nurses). Participants practised Isha Kriya 3 - 4 times a week. Perceived Stress Scale and Profile of Mood States questionnaires were filled by the participants. Perceived stress scores of surgeons and anesthesiologists were higher in comparison with nurses. Meditation resulted in the significant reduction in the perceived stress scores and total mood disturbances in all the participants.

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Influence of Shambhavi Mahamudra on the transient changes of heart rate was studied by Selvaraj et al. [8]. Major states of Shambhavi Mahamudra are breathing rapidly and sitting in a relaxed form, chanting of 'AUM' and Sukha pranayama. Eight practitioners of yoga who were healthy were chosen for this study. Their signals of electrocardiogram were taken during several stages of Shambhavi Mahamudra. During Sukha pranayama, there was an increase in the sympathetic tone and the vagal tone was withdrawn. During the chanting of 'AUM', vagal tone was withdrawn. Electroencephalogram (EEG) recordings of nine Isha Yoga practitioners were taken and their cerebral electrical activity were analysed by Jayashree et al. [9]. Following Shambhavi Maha Mudra brain became deeply focussed suggesting higher level of mental consciousness. The influence of practice of Isha Yoga on the variability of heart rate for a short term and in turn cardiovascular autonomic nervous system was studied by Muralikrishnan et al. [10]. HRV (heart rate variability) of yoga and non-yoga practitioners were compared in this study. Respiratory movements and ECG Lead II were measured during resting period (5 min) and deep breathing period (1 min). Increase in HRV, sympathovagal balance and balance of vagal efferents were observed in Isha yoga practioners in comparison with the non-yoga practioners during resting and deep breathing periods.

Upadhyay et al. [11, 12] studied the response of Isha yoga practitioners on perceived stress, resilence, well-being and COVID 19 response in comparison with the matched controls. The Isha yoga practitioners were observed at baseline (beginning), after six weeks and after 12 weeks. Each participant was assessed through perceived stress scale, joy predisposition, mindful awareness, resilence, mental well-being and post-traumatic growth. There was reduction of stress, improvement in the well-being and COVID 19 protection because of the practice of routine yoga. Upadhyay et al. [13] studied the short-term effects of Shambhavi Mahamudra Kriya (21-minute meditation practice) on 68 participants for a period of six weeks. They observed significant reduction in perceived stress after six weeks in comparison with the baseline case (beginning of the meditation practice).

Hariri et al. [14] conducted online guided meditation training for 15 minutes (Isha Kriya) on subjects aged above 18 for six weeks. Symptoms of anxiety and depression decreased after six weeks into the guided meditation training. Malipeddi et al. [15] studied the impact of Isha Yoga on 1352 yoga adult practitioners in Karnataka. Questionnaires related to psychometry were prepared for bringing out the attributes of stress and well-being. Practioners of Isha Yoga reported decrease in the stress levels and improvement in the well-being levels.

Chang et al. [16, 17] studied the influence of online program on inner engineering online program on 347 participants drawn from diverse cultural, employment and social backgrounds. For four weeks, seven sessions on online mode were conducted in this program. Restfulness, joy, mindfulness improved in the participants. Participants observed improvement in the engagement in work and work meaningfulness. Chang et al. [18] studied the improvement in the well-being and mental health of students (undergraduate) because of Isha Yoga (Upa). This study was conducted in COVID time. In this study, for four weeks, participants were made to do Yoga Namaskars and Nadi Shuddhi. Stress levels reduced and well-being improved significantly among the participants. They concluded that the Isha Yoga can be considered as an effective "as-assigned treatment".

Yadav et al. [19] conducted a randomised controlled trial on 63 patients who tested positive for RT-PCR tests during COVID 19. For ten days, breathing practices based on yoga were done two times a day by yoga group. However, no practice was suggested to the control group. In comparison with the control group, the yoga group experienced lower levels of stress, depression, anxiety and fear towards COVID-19.

Review of the literature indicates that there is a positive influence of guided meditation on the individuals. All the previous studies were conducted mostly on general adults and there are not many studies aimed at alleviating the stress reduction of students especially medical students. Further, the competency based medical education (CBME) introduced yoga into the academic curriculum. The importance of practice and usefulness of meditation was assessed by encouraging medical students to participate in this interventional research study in the department of physiology. Hence, the influence of Isha Kriya on the medical students (first and second year) was undertaken. Main goal of the present study is to explore the positive influence of six-week Isha Kriya intervention on first and second year MBBS students.

MATERIALS AND METHODS

70 medical students (first and second year) from enrolled into this guided meditation. A proposal providing the details of the intervention was submitted to Institute Ethics Committee. On its approval, consent form giving the details of the Isha Kriya and the study was signed by the interested participants. The exclusion criteria excluded those students who had chronic medical illness and are under treatment and students who were practicing other type of yogasanas. The inclusion criteria included healthy medical students (both the genders aged between 18 – 22) who were willing to learn Isha Kriya and were willing to participate in this study without any reservation. Out of 70 participants who were willing to go through this study, four were excluded based on exclusion criterion and two dropped out during the study. Hence, at the end, 64 students participated in this study for a period of six weeks consistently.

In this study, the participants were initiated into a guided meditation for 15 minutes (Isha Kriya) and all the steps were explained in detail. The participants performed the guided meditation once daily for six weeks. Before starting this study, in the zeroth week, Isha Kriya was taught to all the participants by the faculty in the Department of Physiology and observed by a medical student who was one of the investigators in this study. Isha Kriya is a simple guided meditation available freely online, which involves three simple steps of breathing techniques along with employing thought, awareness and chanting. Before the beginning of the Isha Kriya procedure by all the participants, basic parameters like height, weight, age and gender were taken. The readings of blood pressure (systolic and diastolic) and pulse rate were recorded using Dr. Morepen's digital Blood pressure instrument as it is quick to measure and highly reliable. These measurements of blood pressure (systolic and diastolic) and pulse rate were taken at the zeroth week and after the completion of second, fourth and sixth week.

Further, the perceived stress scale questionnaire and well-being index questionnaire were filled by the participants at the zeroth week and after the completion of second, fourth and sixth week. All the data collected on the zeroth week (at the beginning of the guided meditation) was considered as the base line. Since all the participant students resided in the college campus, continuous observation and monitoring of their daily practice was possible.

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Outcome Measures

World Health Organization Well Being Index 5 (WHO - 5) Test:

The WHO - 5 is a concise assessment tool employed to assess a participant's mental well-being in the research [20]. This consists of five items which are having positive connotation (e.g., "I woke up feeling fresh and rested"). The objective of these five items is to objectively quantify positive well-being. Each item is assigned a scale varying from 0 (none of the time) to 5 (all of the time). This methodology of well being index is quite popular as it has been translated in thirty languages. This is widely accepted methodology of quantifying well being index across the world as it is having good properties of psychometry [21].

The questionnaire consists of five questions. Each question is on a scale of six points. The points are ranging from zero to five. Zero indicates "at no time" and five signifies "all of the time". Summation of the numerical values allocated to the responses of all the five questions provides the total score of the well being index. The total score ranges between 0 to 25. The total score is converted into percentage score by multiplying it with four. Hence, zero signifies life of lowest quality and 100 signifies life of highest quality.

Calculation of Perceived Stress:

Questionnaire on perceived stress was given to the participants for quantifying the perceived stress [22]. Perceived stress questionnaire focusses on cognitive perceptions rather than the state of emotion or specific events of life. This methodology of quantifying perceived stress is well accepted in the literature [22 – 24]. Hence, this methodology of perceived stress questionnaire is adopted in the present study. Further, this questionnaire is easy to be filled by the participants and is brief in nature.

The perceived stress questionnaire consists of thirty questions. The score assigned to each question varies from one to four. A score of zero is deemed as lowest level of perceived stress and a score of four is deemed as highest level of perceived stress. The score of all the questions is summed up. Perceived stress index is obtained by deducting the total score by 30 and so obtained score is divided by 90 ($Total\ score - 30/90$). Factor analysis suggests that this score quantifies worries and tension, fatigue, lack of joy, irritability, overload and harassment [22].

Pulse Rate:

Correlation of the pulse rate with autonomic nervous system functions and calmness of mind is established in several studies.

Systolic and Diastolic Pressure:

Systolic and diastolic pressures were measured using standard sphygmomanometer.

Study Design

70 medical students (first and second year) enrolled into this guided meditation. A proposal providing the details of the intervention was submitted to Institute Ethics Committee. On its approval, consent form giving the details of the Isha Kriya and the study was signed by the interested participants. The exclusion criteria excluded those students who had chronic medical illness and are under treatment and students who were practicing other type of yogasanas. The inclusion criteria included healthy medical students (both the genders aged between 18 – 22) who were willing to learn Isha Kriya and were willing to participate in this

study without any reservation. Out of 70 participants who were willing to go through this study, four were excluded based on exclusion criterion and two dropped out during the study. Hence, at the end, 64 students participated in this study for a period of six weeks consistently. This study is a interventional study/quasi experimental study designed with control. Clinical trial registration number of the present study is CTRI/2023/10/058849 (Registered on: 19/10/2023). This work was undertaken at Jagadguru Gangadhar Mahaswamigalu Moorusavirmath Medical College.

Statistical Analysis

Sample size is calculated using the following relation which is appropriate for the comparison between two groups when endpoint is quantitative data

$$Sample\ Size = \frac{2SD^2\left(Z_{\alpha/2} + Z_{\beta}\right)^2}{d^2}$$

- SD – Standard deviation
- $Z_{\alpha/2} = Z_{0.05/2} = Z_{0.025} = 1.96$ (From Z table) at type 1 error of 5% or 95% confidence level
- $Z_{\beta} = Z_{0.2} = 0.842$ (From Z table) at 80% power
- $d =$ Effect size = difference between the mean values

If the variable is well-being index, the effect size is 14 and the standard deviation is 16, then the required sample size is

$$Sample\ Size = \frac{2SD^2(1.96 + 0.842)^2}{d^2} = \frac{2(16)^2(1.96 + 0.842)^2}{14^2} = 21$$

In the present study, the sample size is 64. The sample size chosen is much larger than the sample size obtained from the statistical calculations.

If the variable is perceived stress index, the effect size is 0.06 and the standard deviation is 0.11, then the required sample size is

$$Sample\ Size = \frac{2SD^2(1.96 + 0.842)^2}{d^2} = \frac{2(0.11)^2(1.96 + 0.842)^2}{0.06^2} = 53$$

In the present study, the sample size is 64. The sample size chosen is much larger than the sample size obtained from the statistical calculations. If the variable is pulse rate, the effect size is 9 and the standard deviation is 16, then the required sample size is

$$Sample\ Size = \frac{2SD^2(1.96 + 0.842)^2}{d^2} = \frac{2(16)^2(1.96 + 0.842)^2}{9^2} = 50$$

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In the present study, the sample size is 64. The sample size chosen is much larger than the sample size obtained from the statistical calculations. If the variable is blood pressure, the effect size is 5 mm of water column and the standard deviation is 9, then the required sample size is

$$Sample\ Size = \frac{2SD^2(1.96 + 0.842)^2}{d^2} = \frac{2(9)^2(1.96 + 0.842)^2}{5^2} = 51$$

In the present study, the sample size is 64. The sample size chosen is much larger than the sample size obtained from the statistical calculations. Continuous data are presented as means (standard deviation) after confirming the data follows normal distribution through Shapiro-Wilk test. The data of all the participants collected in the zeroth week is considered as baseline score. The data of subsequent weeks (end of 2nd, 4th and 6th week) is considered as follow-up score. The baseline measurements are compared with measurements after the completion of 2nd, 4th and 6th week using *t* tests of paired samples. Differences in the parameters like perceived stress index, well-being index and pulse rate were the primary variables of the present study. Systolic and diastolic pressures are also presented. If the two sided *p* – values are less than 0.05, then the results are considered as statistically significant. A control group comprising of 65 students who did not practice the Isha Kriya was chosen. Not much variability in the physiological parameters and stress levels was observed between the beginning of the zeroth week (base line) till the end of the 6 weeks study.

RESULTS

Baseline Characteristics

Outcomes:

The variation of well being index, perceived stress index, pulse rate, systolic and diastolic pressure values are reported.

Well-being Index:

Table 1 provides the details of the mean and standard deviation of well-being Index (WHO-5) monitored from the beginning of zeroth week till the completion of six weeks. Change in the score of well-being index from the beginning of zeroth week till the completion of six weeks (mandala) is statistically significant because the paired samples *t*-test resulted in a *p* - value of 0.00099. This suggests that there is a significant improvement in the well-being index.

Table 1: Details of the statistics of Well Being Index (WHO-5)

Beginning of zeroth Week (Base line)		Completion of week 2		Completion of week 4		Completion of week 6	
Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
62.24	18.76	66.52	20.8	72.00	17.42	75.91	15.74

Figure 1 shows the variation of the well-being Index (WHO-5) from from the beginning of zeroth week till the completion of six weeks (mandala).

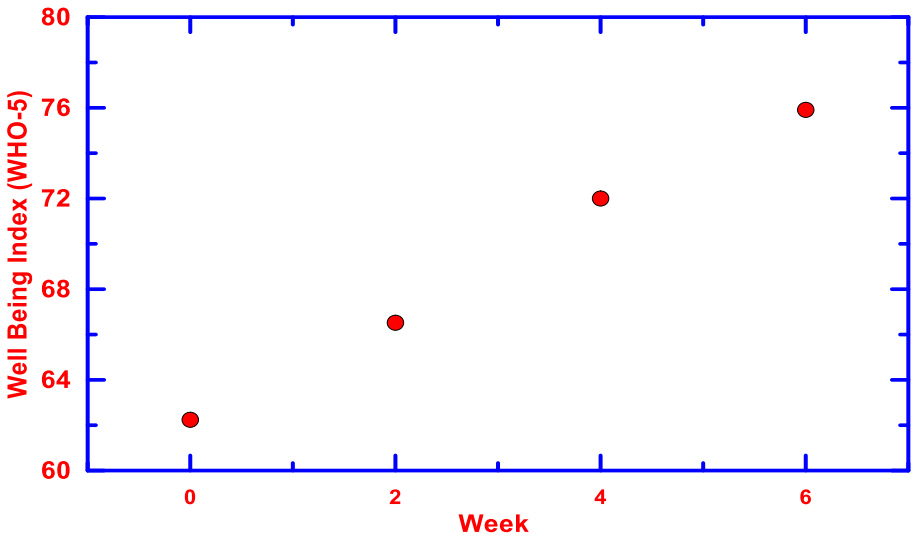

Figure 1: Variation of the Well-Being Index (WHO-5) from zeroth week to the end of sixth week (one mandala)

Zero score indicated the lowest possible quality of life, while 100 score represented the highest achievable quality. It can be seen that the Well-Being Index is increasing consistently suggesting that Isha Kriya has improved the quality of life. Hence, there is an improvement in the well being index by 22 %.

Perceived Stress Index

Table 2 provides the details of the mean and standard deviation of perceived stress index from the beginning of zeroth week till the completion of six weeks. Change in the score of perceived stress questionnaire index from the beginning of zeroth week till the completion of six weeks (mandala) is statistically significant because the paired samples *t* test resulted in a *p*-value of 0.005. This suggests that there is a significant improvement in the perceived stress index.

Table 2: Details of the statistics of Perceived Stress Index

Beginning of zeroth Week (Base line)		**Completion of week 2**		**Completion of week 4**		**Completion of week 6**	
Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
0.4495	0.1321	0.4073	0.1078	0.3908	0.139	0.3891	0.1267

Figure 2 shows the variation of the perceived stress index from the beginning of zeroth week till the completion of six weeks (mandala). A value of 0 suggests that the perceived stress is at a lowest level of perceived stress and value of 1 suggests that the perceived stress is at highest level. It can be seen that the perceived stress index is decreasing consistently suggesting that Isha Kriya has a positive result on the individuals. Hence, there is an improvement in the perceived stress index by 13.4 %.

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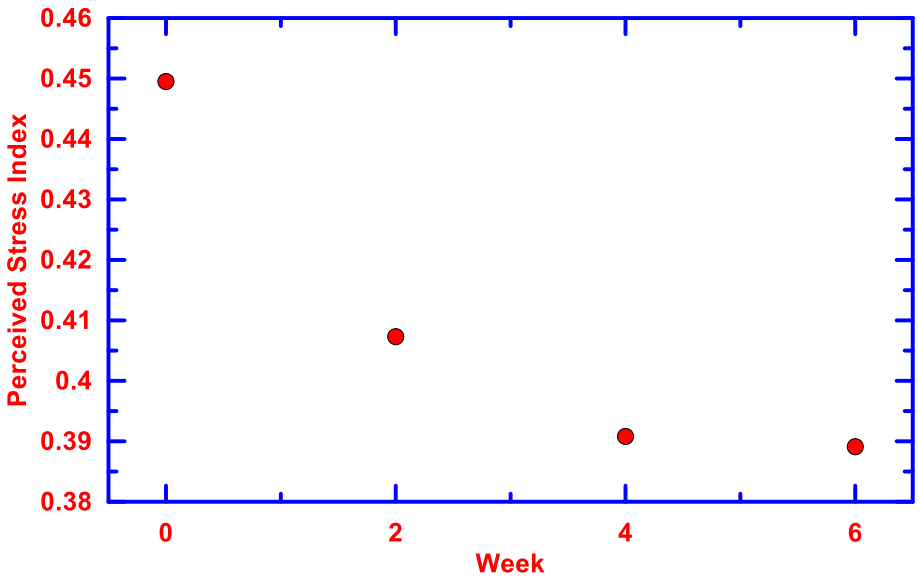

Figure 2: Variation of the perceived stress index from zeroth week to the end of sixth week (one mandala)

Pulse Rate

Table 3 provides the details of the mean and standard deviation of pulse rate from the beginning of zeroth week till the completion of six weeks. Change in the score of pulse rate from the beginning of zeroth week till the completion of six weeks (one mandala) is statistically significant because the paired samples *t* test resulted in a *p* - value of 0.00002. This suggests that there is a significant improvement in the pulse rate.

Table 3: Details of the statistics of Pulse Rate

Beginning of zeroth Week (Base line)		Completion of week 2		Completion of week 4		Completion of week 6	
Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
92.5	16.3	88.4	14.4	84.7	14.9	83.2	14.4

Figure 3 shows the variation of the pulse rate (beats per minute) from the beginning of zeroth week till the completion of six weeks (one mandala). Ideal pulse rate would be around70- 80 beats per minute. Pulse rate indicates the anxiety levels of the individuals. It can be seen that the pulse rate is stabilising to around 80 beats per minute by the end of the sixth week. So, pulse rate is improving consistently suggesting that Isha Kriya has a positive result on the individuals.

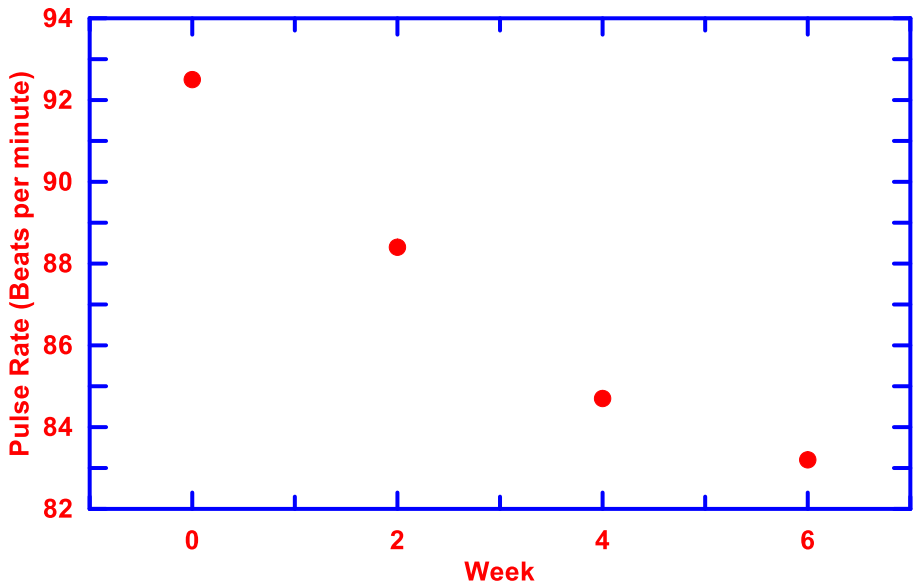

Figure 3: Variation of the pulse rate from zeroth week to the end of sixth week (one mandala)

Systolic and Diastolic Pressure

Table 4 provides the details of the mean and standard deviation of systolic pressure from the beginning of zeroth week till the completion of six weeks. Change in the score of systolic pressure from zeroth week to the end of sixth week (one mandala) is statistically significant because the paired samples *t* test resulted in a *p* - value of 0.04. This suggests that there is significant improvement in the systolic pressure.

Table 4: Details of the statistics of systolic pressure

Beginning of zeroth Week (Base line)		Completion of week 2		Completion of week 4		Completion of week 6	
Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
125.8	13.6	124	14.4	121.3	12.7	120.3	14.2

Figure 4 shows the variation of the systolic pressure (mm of mercury) from the beginning of zeroth week till the completion of six weeks (one mandala). Ideal systolic pressure would be around100-120mmHg. It can be seen that the systolic pressure is decreasing substantially from the beginning of zeroth week till the completion of six weeks. So, the systolic pressure is improving consistently suggesting that Isha Kriya has a positive result on the individuals.

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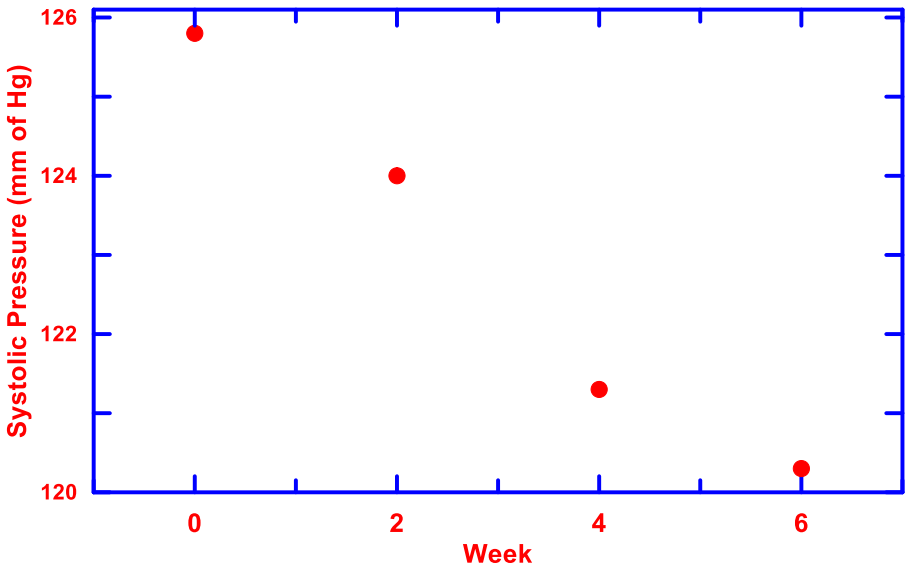

Figure 4: Variation of the systolic pressure from zeroth week to the end of sixth week (one mandala)

Table 5 provides the details of the mean and standard deviation of diastolic pressure from the beginning of zeroth week till the completion of six weeks. Change in the score of diastolic pressure from the beginning of zeroth week till the completion of six weeks (mandala) is statistically insignificant because the paired samples *t* test resulted in a *p* - value of 0.99. This suggests that there is insignificant influence on the diastolic pressure.

Table 5: Details of the statistics of diastolic pressure

Beginning of zeroth Week (Base line)		Completion of week 2		Completion of week 4		Completion of week 6	
Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
77.3	8.8	80.5	11.0	79.6	7.5	79.0	12.0

DISCUSSION

In the present study, the influence of 15-minutes guided meditation (Isha Kriya) on first and second year MBBS students for six weeks is investigated. Well-being index and perceived stress index are the two neuropsychological parameters which are assessed through both prevalidated WHO-5 questionnaire and well accepted perceived stress questionnaire. Well being index improved from 62.24(zeroth week – base line) to 75.91 (completion of week 6) suggesting a 22 % improvement. Perceived stress index decreased from 0.4495 (zeroth week – base line) to 0.3891 (completion of week 6) suggesting a 13.4 % improvement.

Pulse rate, systolic and diastolic pressures are measured to get an indication of the anxiety levels of the students. Pulse rate stabilised from 92.5 (beginning of the zeroth week) to 83.2 (completion of week 6). This suggests that there is improvement in the stabilisation of the pulse rate. Regular practice of Isha Kriya helps to increase the vagal tone by stimulating the vagus. This stimulation of the vagus helps in relaxing the mind and cardiac functions, thereby stabilising the pulse rate and eventually decrease the anxiety levels. Hence, Isha Kriya prevents chronic stress in medical students. Systolic pressure improved significantly with the guided

meditation (from 125.8 at the beginning of zeroth week to 120.3 after the completion of week 6). However, not much significant impact on the diastolic pressure was observed.

The main limitation of the present study is the absence of the quantification of reduction of stress caused by Isha Kriya through objective bio-chemical markers. All the conclusions drawn are through self-reported questionnaire which may be regarded as subjective to a certain extent.

CONCLUSIONS

This study involves practicing of 15-minutes guided meditation (Isha Kriya) administered appropriately by first and second year MBBS students for just six weeks. The improvement in the mental and physical health of the students was quantified by using psychological parameters like perceived stress index and well-being index and assessing the physiological parameters like blood pressure and pulse rate which is controlled by autonomic nervous system. By the end of six weeks, there was considerable improvement in the perceived stress index, well being index and improved pulse rate. This study emphasises the potential of Isha Kriya as an effective and holistic tool to rejuvenate the healthy lifestyle among medical students. As medical students have paucity of sparing their time from hectic schedule on daily basis, this 15- minute Isha Kriya proves to have a significant advantage in convincing the students to embed this guided mediation as a part of their daily lives. Major advantages of this 15-minute Isha Kriya are, it is freely available online, easy to practice daily at any time of the day and there are no restrictions of being empty stomach by the individual.

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