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## Influence of Meditation with Autosuggestion on Respiratory Parameters as Compared with Meditation Alone.

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### ABSTRACT

Meditation has profound effects on psychology and physiology. However less is known about the effect of Autosuggestion on physiological parameters. So the objective of this study is to assess the effect of meditation alone and the added effects of autosuggestion to meditation and to compare the effects of the two on respiratory parameters. The respiratory parameters like RR, TV, FVC, FEV1 and FEV1% were recorded by computerised Spirometer in 60 medical students of age group 16 to 20years, who were divided into two equal teams to be trained on meditation and meditation with autosuggestion. Results showed significant decrease ( $p < 0.001$ ) in RR in both the groups after the training session. There was a significant increase in TV, FVC, FEV1 and FEV1% in both groups, but no significant differential increase between the groups, though meditation with autosuggestion had greater increase of all above compared to only meditation group. From the above results it was concluded that meditation can bring significant improvement in respiratory performance and wellbeing. Inculcation of autosuggestion in the practice provides an added benefit.

**Keywords:** Meditation, Autosuggestion, Spirometer, Pulmonary function tests.

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## INTRODUCTION

Pranayama and Meditation as a natural way of cleansing breath has been suggested as a route to healthy body and mind [1, 2] Meditation is said to be an altered state of consciousness achieved through controlled breathing and visualization. Research on meditation began in 1931, with scientific research increasing dramatically during the 1970s and 1980s [3].

Concentrative meditation focuses the attention on breath, an image, or a sound (mantra), in order to still the mind and allow a greater awareness and clarity to emerge. The simplest form of Concentrative meditation is to sit quietly and focus the attention on the breath. Yoga and meditation practitioners believe that there is a direct correlation between one's own breath and state of the mind. For example, when a person is anxious, frightened, agitated, or distracted, the breath tends to get shallow, rapid, and uneven. On the other hand, when the mind is calm, focused and composed, the breath is slow, deep, and regular [4].

Autosuggestion also known as Affirmations, self hypnosis, is a way of reprogramming the subconscious to think differently and to automatically react in a more positive way when situations trigger in life. Affirmations can be any statement. Louise Hay (1999) puts the concept this way, "Learn to think in positive affirmations. Too often we think in negative affirmations. Negative affirmations only create more of what is said don't want. Saying, 'I hate my job' will get you nowhere. Declaring, 'I now accept a wonderful new job,' will open the channels in your consciousness to create that." It sounds simple, but reciting this kind of basic affirmation can do a lot to change your thoughts and automatic reactions to situations that bring up anxiety [5-7].

Pulmonary Function Tests (PFT) provide important an information relating to the large and small airways, the size and integrity of the pulmonary capillary bed and the pulmonary parenchyma. Although they do not provide a diagnosis per se, different patterns of abnormalities are seen in various respiratory diseases which helps to establish a diagnosis. Using a computerised Spirometer airflow obstruction can be diagnosed by demonstrating a lower than predicted FEV<sub>1</sub>/FVC ratio [8,9].

## MATERIALS AND METHODS

The study group consists of 60 medical students, healthy males and females in the age group of 16 to 20 years of 1<sup>st</sup> year MBBS, studying in Mysore Medical College & Research Institute, Mysore, were selected randomly and included in the study. Students who had any systemic illness, undergone major surgeries, history of consumption of alcohol or tobacco in any form or practised yoga, meditation previously were excluded. Study was conducted after obtaining a ethical clearance from 'Mysore Medical College & Research Institute Ethical Committee for Research'.

Subjects were examined for their general physical health. Subject's clinical history and details were taken, vitals were noted according to the standard Proforma.

Subjects were divided into two equal groups to be trained on

- i) Meditation— Group I(n=30) and
- ii) Meditation with Autosuggestion— Group II(n=30)

Computerized Spirometer Schiller AT-60 was used for the assessment of the respiratory parameters. All the following parameters were recorded before the beginning of meditation practice.

**The respiratory rate (RR)** was counted while the subjects were lying in the supine position by palpatory method.

**Tidal volume (TT):** Subjects were made to stand, nose clipped and asked to breath normally through the Spirometer and the Tidal volume was noted.

**Forced Vital capacity (FVC):** Subject's nose was unclipped asked to perform deep inspiration from the atmospheric air and then nose clipped and perform rapid and forceful expiration through the Spirometer tube

and Forced Vital capacity was noted.

**Forced expiratory volume 1 (FEV1)** : volume of air expired in first second of exhalation- FEV1 was noted from FVC

**FEV1%** : was calculated as  $FEV1 / FVC \times 100$

For 30 subjects Om meditation [10] training was given for 3 months.

**Protocol of meditation**

GROUP I -- 10 min loosening exercise → 5min breathing exercise → 15 min OM meditation.

Training was provided in the evening 4.15pm to 5.00pm six days a week for 3 months using a pre recorded CD.

Another group of 30 subjects were trained for meditation followed by autosuggestion for next 3 months in the same schedule using the same prerecorded CD. Autosuggestions were repeated orally as instructed by the Trainer.

**Protocol for meditation with autosuggestion**

GROUP II-- 10 min loosening exercise → 5 min breathing exercise → 10 min OM meditation → 5 min Autosuggestion.

Autosuggestion's were as follows

- Day by day in every way I am becoming better and better
- Day by day my health is improving
- All my organs are functioning normally and to its optimum
- Day by day my performance is improving in all aspects
- All my tensions are getting relieved.

**Statistical Methods**

Descriptive statistics were calculated for individual statements. Paired sample T test was applied to compare the means of variables before and after the intervention in each group. Repeated measure ANNOVA was applied to find the differential statistics between the two groups. All the statistical calculations were done through SPSS 16.0 (2007) for windows.

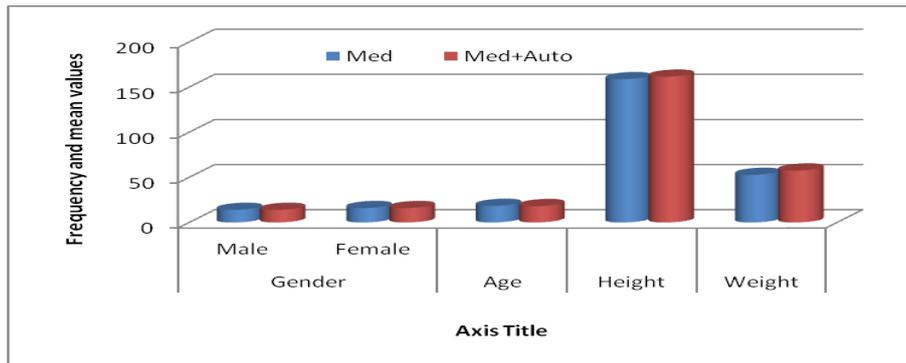
**RESULTS**

The physical characteristics of the 30 subjects in the group I, and 30 subjects in the group II are tabulated and correlated in (Table: 1), (Graph-I)

**Table 1: Physical characteristics of the subjects**

		GROUP I	GROUP II
GENDER	MALE (n)	14	14
	FEMALE (n)	16	16
AGE in years (Mean)		18.3	18.4
HEIGHT in Cm(Mean)		161.6	158.8
WEIGHT in Kg (Mean)		57.6	52.8

Figure I: Physical characteristics of the subjects



The test parameters RR, FVC, FEV1, FEV1% were tabulated and correlated within the groups and between groups.

In the pre intervention stage, Group I had a mean RR value of 18.80 ±3.078 and meditation with autosuggestion group had a mean RR value of 19.2±3.84, in the post intervention period it decreased to 16.80± 1.6 and 16.83 ±1.68 respectively. In both the groups there was statistically significant (P<0.001) decrease in respiratory rate.

Mean RR values was compared between the groups. There was no significant difference observed before the intervention but post intervention Group II had a greater decrease in mean RR but repeated measure ANOVA did not reveal a statistically significant decrease(P=0.545) between the two groups. (Table-2),(Graph-II).

Table 2A: Comparison of pre intervention and post intervention Respiratory rate(RR)

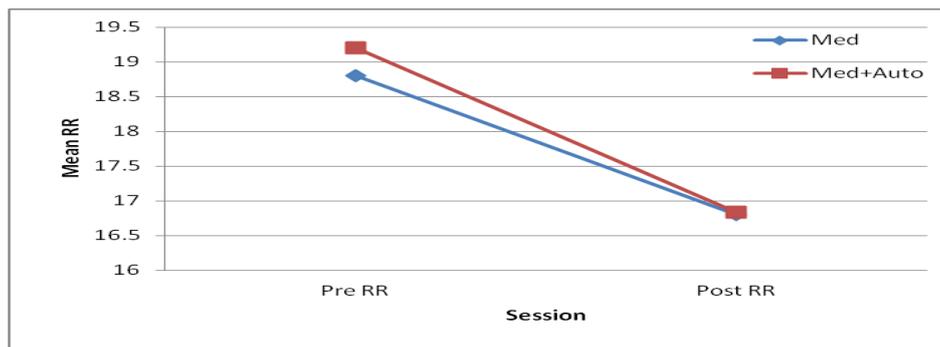
	GROUP	Mean	Std. Deviation	N
PRE RR	GROUP I	18.8	3.1	30
	GROUP II	19.2	3.8	30
POST RR	GROUP I	16.80	1.60	30
	GROUP II	16.83	1.68	30

a)PRE- Pre intervention, b)POST- Post intervention

Table 2B

Source	Type III Sum of Squares	df	Mean Square	F	Significance
CHANGE WITHIN GROUP	143.008	1	143.008	52.669	.000
CHANGE BETWEEN GROUP	1.008	1	1.008	.371	.545

Figure II: Comparison of pre intervention and post intervention Respiratory rate(RR) between the groups meditation and meditation with autosuggestion.



In the pre intervention phase, mean tidal volume of the two groups were 317.33±73.48, 374.33±68.82 which has been increased to 397.67 ± 47.25 and 428.33 ±45.19 after the training sessions, and the increase was found to be statistically significant in both groups (P<0.001). When both groups were compared with each other Group II had a greater increase in TV and repeated measure ANOVA showed a statistically significant differential increase (P=0.042) (Table-3),(Graph-III)

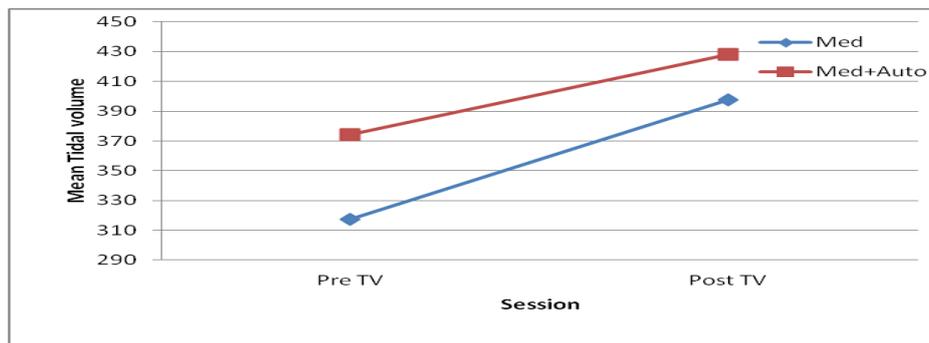
**Table 3A: Comparison of pre intervention and post intervention Tidal volume (TV)**

	GROUPS	Mean	Std. Deviation	N
PRE TV	GROUP I	317.3	73.49	30
	GROUP II	374.3	68.81	30
POST TV	GROUP I	397.6667	47.25	30
	GROUP II	428.3333	45.19	30

**Table 3B**

Source	Type III Sum of Squares	df	Mean Square	F	Significance
CHANGE WITHIN GROUP	135340.833	1	135340.833	112.447	.000
CHANGE BETWEEN GROUPS	5200.833	1	5200.833	4.321	.042

**Figure III: Comparison of pre intervention and post intervention Tidal volume (TV) between the groups meditation and meditation with autosuggestion.**



The mean value of FVC before intervention was 1661.67 ± 339.83 and 2085.33± 599.78 which was increased to 2765.0± 385.45 and 3029.67±443.35 in Group I & Group II respectively. In the post intervention stage there was a statistically significant increase (P<0.001) in both groups. The 2 groups were compared with each other. There was a greater increase of FVC in Group II but the increase was not statistically significant(p=0.113) (Table-4),(Graph-IV)

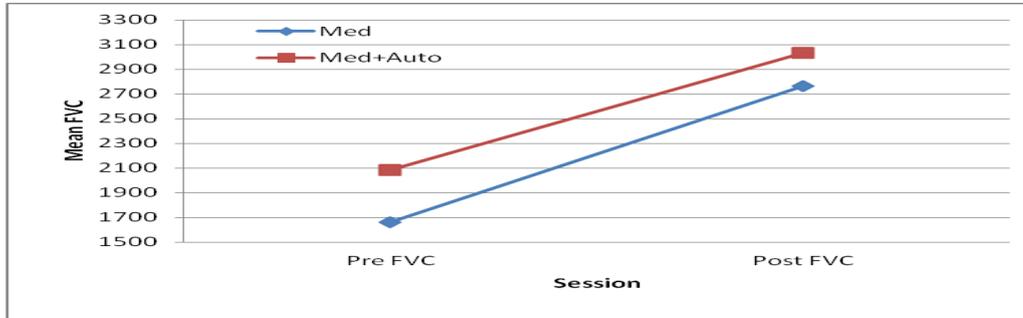
**Table 4A: Comparison of pre intervention and post intervention Forced Vital capacity (FVC)**

	GROUP	Mean	Std. Deviation	N
PRE FVC	GROUP I	1661.67	539.78	30
	GROUP II	2085.33	399.8	30
POST FVC	GROUP I	2765.0	385.45	30
	GROUP II	3029.67	443.35	30

Table 4B

<b>CHANGE WITHIN GROUP</b>	31447040.833	1	31447040.833	296.651	.000
<b>CHANGE BETWEEN GROUPS</b>	189607.500	1	189607.500	1.789	.186

Figure IV: Comparison of pre intervention and post intervention Forced Vital capacity (FVC) between the groups meditation and meditation with autosuggestion.



The mean value of FEV1 in Group I and Group II was  $1177.33 \pm 277.38$  and  $1517.67 \pm 443.36$  respectively. which was increased to  $2234.33 \pm 365.57$  and  $2408.00 \pm 352.94$  in the post intervention and the increase was found to be statistically significant ( $P < 0.001$ ) in both groups. The increase in FEV1 was more in Group II compared to Group I though it was not a significant increase ( $P = 0.113$ ). (Table 5) , (Graph: V).

Figure V: Comparison of pre intervention and post intervention Forced expiratory volume1 (FEV1) between the groups meditation and meditation with autosuggestion.

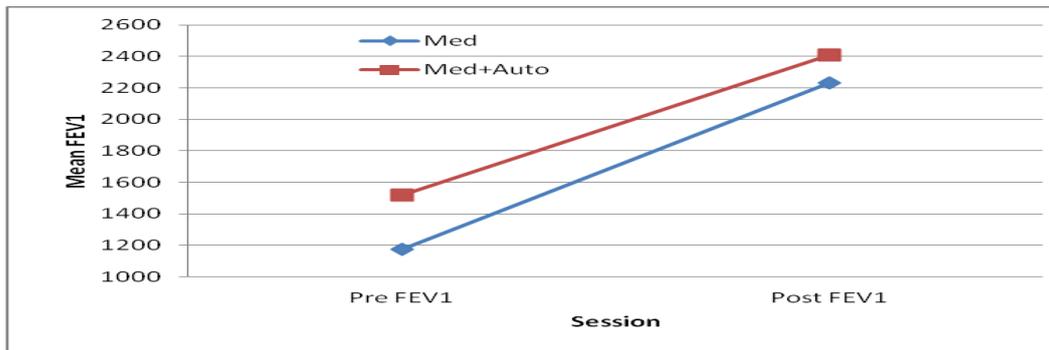


Table 5A: Comparison of pre intervention and post intervention Forced expiratory volume in 1sec (FEV1).

	GROUP	Mean	Std. Deviation	N
PRE FEV1	GROUP I	1177.33	277.38	30
	GROUP II	1517.67	418.41	30
POST FEV1	GROUP I	2234.33	365.57	30
	GROUP II	2408.00	352.94	30

Table-5B

<b>CHANGE WITHIN GROUPS</b>	28440803.333	1	28440803.333	354.497	.000
<b>CHANGE BETWEEN GROUPS</b>	208333.333	1	208333.333	2.597	.113

The mean FEV1% of Group I was  $71.15 \pm 5.46$  and Group II was  $73.11 \pm 6.19$  which was increased to  $80.59 \pm 4.4$  and  $79.52 \pm 4.2$  respectively. Both increase were found to be statistically significant ( $P < 0.001$ ). In the pre intervention, there was no significant difference observed between the two groups, In the post

intervention period, meditation group had greater increase of FEV1% compared to meditation with autosuggestion group but the increase was not statistically significant (P=0.066) (Table 6) , (Graph VI )

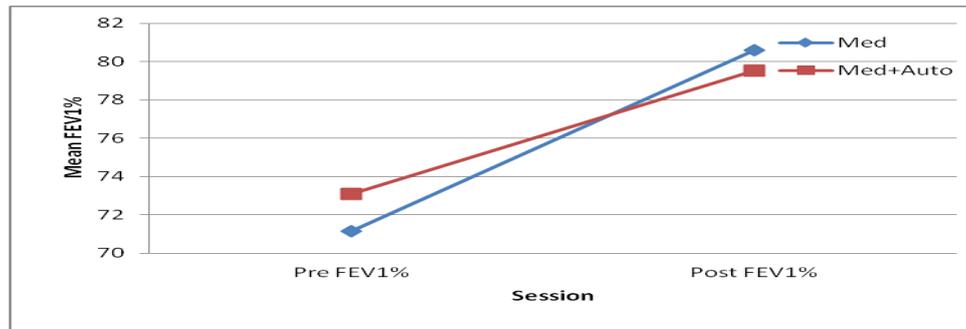
**Table 6A: Comparison of pre intervention and post intervention Forced expiratory volume 1 % (FEV1%)**

	GROUP	Mean	Std. Deviation	N
PRE FEVPE	GROUP I	71.1537	5.45944	30
	GROUP II	73.1100	6.18259	30
POST FEVPE	GROUP I	80.5910	4.39914	30
	GROUP II	79.5167	4.20107	30

**Table 6B**

<b>CHANGE WITHIN GROUP</b>	1882.743	1	1882.743	96.014	.000
<b>CHANGE BETWEEN GROUPS</b>	68.887	1	68.887	3.513	.066

**Figure VI: Comparison of pre intervention and post intervention Forced expiratory volume1 (FEV1%) between the groups meditation and meditation with autosuggestion.**



Thus all the test parameters were recorded before and after the intervention in the two groups which performed meditation (Group I) and meditation with autosuggestion (Group II). We found a statistically significant  $P < 0.001$  increase in TV, FVC, FEV1, FEV1% and there was significant decrease in RR. The changes noted were more in Group II compared to Group I

### DISCUSSION

The main goal of the study was to detect changes in Respiratory parameters after meditation practice and also to observe the changes when autosuggestion which is a synonym for self hypnosis was included during the practice.

The present study demonstrates that regular practice of Omkar meditation causes a decrease in the respiratory rate.

Our results were consistent with other studies done by, Corey. P.W.(1973) [11] who found increased airway conductance and increased ease of breathing during and after meditation practice. Wallace RK(1970)[12] reports significant decrease in respiratory rate with a mean decrease of 3 breaths/min during meditation. John T Farrow(1975) [13, 14] in his study reported statistically significant reduction in respiratory rate, wherein he observed 60% reduction in the respiratory rate.

Majority of scientific studies show meditation to be a wakeful state accompanied by decreased metabolism [15]. The generalized decrease in metabolism manifests with decreased respiratory rate. During meditation practice respiratory rate decreases due to natural reduction in metabolic activity at cellular level and not from a forced reduction of breathing.

Our results show statistically significant ( $p < 0.001$ ) increase in TV, FVC, FEV1, FEV% after regular practice of meditation. This can also be attributed to the Pranayama, which is an integral part of yogic practices, reported to improve breathing rate and ventilatory function of the lung. This could be due to strengthening of respiratory musculature during regular practice of pranayamic breathing. Meditative practices are associated with slow and deep type of breathing. Hence there is an increase in TV, FVC, FEV1, FEV%. Few studies Makwana et al., [18]; Joshi et al [19], showed similar results with a Significant improvement in FVC, FEV1, FEV1%, PEF, and MVV.

Studies done by Wolkow. N, et al [16] reported a decrease in the Minute Ventilation, Tidal Volume and changes in breathing pattern during meditation which is contradicting to other studies. R.N. Raichur [17] in their study, after twelve weeks of meditation practice, showed a statistically significant increase in the Tidal Volume ( $p < 0.01$ ), but a reduction in the Minute Volume and no statistically significant change in the Vital Capacity, FEV1, FVC, FEV1/FVC, ERV, IRV, IC, MMEF, PEF, MEF, and MVV.

### CONCLUSION

Meditation involves breathing technique which helps to improve breathing pattern and can be a boon to minimize respiratory disorders. Deep breathing is one of the simplest ways that one can learn to relax.

In our study there was a significant improvement in respiratory parameters TV, FVC, FEV1, FEV1%, and reduced respiratory rate, which shows an improved ventilatory function, and strengthening of respiratory musculature. The Improvement was higher in meditation with autosuggestion group more so with respect to Tidal volume which showed statistically significant increase. This could be because of conscious effort in increasing the depth of breathing during autosuggestion.

These observations suggest that regular practice of Omkar meditation can bring significant improvement in the respiratory performance and well-being and inculcation of autosuggestion in the practice provides an added benefit.

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