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Effect of 'Meditation technique' on work performance and work of head of departments at a dedicated COVID-19 tertiary care hospital: A prospective, interventional, single blind, randomized control study

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ABSTRACT

Background: Mindfulness-based programs were shown to promote relaxation, and improve work performance. We evaluated the effect of an indigenous meditation technique in the work performance of Heads of Departments (HODs) in our institute.

Materials and Methods: We carried out a prospective, interventional, single centre, single blinded, randomized controlled, study to evaluate the effect of meditation technique on work performance and acceptability (among employees) of HODs working in a dedicated COVID-19 tertiary care hospital. We also recruited employees from each of the Departments for obtaining their feedback. A validated feedback evaluation questionnaire was used for assessing the outcomes at baseline, and on days 1, 8, 9, 10, 11, and 12.

Results: Twenty HODs of either gender aged between 36 to 58 Years, with atleast 5 years of experience as Heads leading the respective teams were recruited. One-hundred employees aged between 21 to 58 years reporting at least for one year reporting to those HODs were recruited. The mean (SD) feedback score of the employees in the control arm was 22.98(7.2) while in the interventional arm, it was 21.82 (6.4) and was not statistically significant (p=0.28). On all the follow-up days, the scores were significantly higher in the interventional group compared to control arm. Similarly, in the interventional group, the scores were significantly higher on all the follow-up days compared to baseline while it was not statistically significant in the control group.

Conclusion: We observed a significant improvement in the work performance of HODs as evaluated by their respective employees through the meditation technique that consisted of breathing exercise and chanting the *mantra*. Studies are needed exploring the effects in different units and for long term.

1. Background

Workplace satisfaction plays a dominant role in improving the positive work behavior leading to an improvement in the work productivity.[1] Quality and motivated administrators are essential and can boost the performance of employees. In the hospital set-up particularly during situations of

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crisis, work overload, poor interpersonal relations and unsupportive climates are common and contribute to staff burnout, low self-esteem and poor quality of life.[2] Support from the immediate-level managers is crucial and a key determinant for staff's performance and in hospital set-up has been shown to improve the mortality.[3] Excessive turnover of employees has been shown to increase the expenditure of the hospitals.[4]

Previous studies have established that the satisfaction of employees significantly improve provided they were given opportunities for empowerment, growth, and promotion.[5] The term "Magnet hospitals" has been used where more autonomy, democratic approach, mutual trust, and co-operation have been the core.[6] A down-stream effect is observed from the higher rank administrators to their sub-ordinates in case of their poor satisfaction and perturbs the work environment. Regular meditation or breathing exercise has been shown to improve autonomic functions by decreasing the sympathetic activity and by increasing the vagal tone[7–10] Heart rate variability, a functional indicator of autonomic nervous system activity, has been observed to be deranged in several mental health disorders such as posttraumatic stress disorder, major depressive disorder, and schizophrenia.[11] Chanting *mantras* has been shown to improve the stress levels, promotes relaxation, improve self-realization, self-awareness, and so is expected to improve the work performance and satisfaction. Chanting *Mahamantra* has been observed to be a simple, cheap, and effective coping mechanism to reduce stress in a busy hospital environment.[12] We carried out the present study to evaluate whether chanting the *Mahamantra* improves the mental well-being and work performance of the Head of administrative Departments (HODs) at a dedicated COVID-19 tertiary care hospital.

2. Materials and Methods

2.1. Study ethics and design

The study was initiated after obtaining approval from the Institutional Ethics Committee and approval from the Ministry of Health (EC/NEW/INST/2019/245). The study was a prospective, interventional, single centre, single blinded, randomized, controlled study. The study was carried out in the hospitals dedicated for treating COVID-19 patients approved by Government of India, during July and August 2020. We complied with the latest update of Declaration of Helsinki guidelines. Written informed consent was obtained from each study participant.

2.2. Study participants

We recruited 20 personnel of either sex, between 36 and 58 years of age who were serving as Heads of Departments (HODs) for at least 5 years in our tertiary care hospital. These participants provided consent and were willing to participate in meditation workshop daily for 15 minutes for 12 days. Additionally, we recruited 100 employees (between 21 to 58 years) working in the hospital and directly reporting to the recruited HODs for at least for one year for obtaining their feedback about the performance of their HODs. Those diagnosed with a self-reported diagnosis of psychiatric disorder, neurological disorder, or substance/alcohol use disorder were excluded. Similarly, those already practicing any relaxation techniques/undergoing psychotherapy were excluded.

2.3. Intervention ARM

The HODs were provided with the following set of interventions for duration of 15 minutes per day during their work time in the hospital premises:

1. *Breathing exercises*: This was carried out for five minutes. Participants were asked to lie down supine on the floor with a pillow under their head and knees. They were trained to breathe in through nose and hold their breath until they feel full abdomen. Then, the participants were asked to breathe out through their nose while placing one hand on their abdomen and another on their chest. Participants were asked to feel the movement of their abdomen up and down, when they were breathing in and out, respectively. They were instructed to take three fuller, deep breaths.
2. *Omkar Chanting*: The participants were instructed to chant for six times (three in the beginning and three at the end of breathing exercise). The participants were trained in clear pronunciation of the syllables 'A', 'U' and 'M', with a gradual transition from one to another. 'A' is pronounced as 'a' in 'palm', 'U' is pronounced as 'ooo', and 'M' is pronounced as a humming sound by closing the lips 'mmmmmmm'. The sound of 'A' should start at the navel, 'U' from the chest and 'M' from brain (head). Participants were trained to generate sound from the navel and take it slowly to the top of the head with the closing sound of 'M'. They should open the mouth slightly, without touching the tongue to the pallets of the mouth, while 'A' was pronounced. Opening the mouth in a beak shape, like whistling, the tongue touching the back of the lower teeth slightly, while 'U' was pronounced, and they should close the mouth and simply producing the humming sound (mmmmmmmm) 'M' was pronounced. All the three sounds were pronounced rhythmically, in this way AUM was chanted, with the 'M' sound leaving its vibration.
3. *Repetition of Mantra*: This was carried out for 5 minutes. Participants were trained to chant "Hare Krishna Mahamantra" that is as follows: *"Hare Krishna Hare Krishna Krishna Krishna Hare Hare. Hare Rama Hare Rama Rama Rama Hare Hare"*. They

Table 1: Feedback questionnaire provided to employees.

S. No.	Questions	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
1	My manager is a accommodative / understandable/considerate person.	1	2	3	4	5
2	Empathic towards you	1	2	3	4	5
3	Appreciates your ideas and your work	1	2	3	4	5
4	Problem-Solver	1	2	3	4	5
5	Enthusiastic	1	2	3	4	5
6	Competent to discharge duties	1	2	3	4	5
7	Ability to delegate task	1	2	3	4	5
8	Cool Under Pressure	1	2	3	4	5
9	Team Building Spirit	1	2	3	4	5

Table 2: Comparison of the feedback scores between intervention and control groups.

Feedback score on	Intervention (n=50)		Control (n=50)		p-values
	Mean	SD	Mean	SD	
Day 8	33.74	3.469	22.04	7.959	<0.0001
Day 9	37.66	3.035	25.46	7.924	<0.0001
Day 10	39.42	6.456	21.04	7.154	<0.0001
Day 11	42.94	3.178	21.78	6.637	<0.0001
Day 12	43.26	2.783	22.80	7.177	<0.0001

Table 3: Comparison of feedback score between day 1 and day 8 to day12 in intervention group.

Feedback score on	Feedback score		percent change	F value*	P value
	Mean	SD			
Day 1	21.82	6.401	NA	405.73	<0.0001
Day 8	33.74	3.469	54.63		
Day 9	37.66	3.035	72.59		
Day 10	39.42	6.456	80.66		
Day 11	42.94	3.178	96.79		
Day 12	43.26	2.783	98.26		

NA-Not applicable; *F Value = Repeated measures of ANOVA

were asked to chant 27 times (one-fourth of one round of 108 mantram repetition).

2.4. Control ARM

They were not provided with any active intervention but their usual pattern/standard of work.

2.5. Outcomes

Feedback of the employees on their respective HODs who participated in the study was evaluated on days 1, 8, 9, 10, 11, and 12 after randomization.

2.6. Study procedure

The eligible participants were randomized to either control or interventional arm. During the baseline visit (day 1), the employees filled the feedback questionnaire scale on their HODs and their demographic details were obtained. The above intervention was provided to HODs from Day 2 to 12 for the interventional arm. After a week of intervention (Day 2 to 7), all employees, at the end of office working hours (both for control and intervention group) filled the feedback questionnaire scale from Day 8 to 12. For HODs in the intervention arm, intervention was continued Day-8 to 12. The feedback questionnaire scale (9 items) was validated for reliability in an initial cohort of 10 participants who were not included in the main study (*kappa* value of 0.85 was observed). It was ensured that at least five employees were recruited for each HOD.

3. Statistical Analysis

Descriptive statistics was used for representing the demographic variables. Considering the absence of any previous estimates, we did not estimate the sample size. Mann-Whitney U test was used for comparing the scores between the groups at baseline and on each of the follow-

up days. Repeated measures ANOVA with post-hoc Tukey's tests was carried out for comparing the scores on the follow-up scores. Randomization was carried out using computer generated random numbers and the allocation was concealed until evaluation of the eligibility of the study participants was carried out.

4. Results

4.1. Demographics

Twenty-six HODs were screened of which six were excluded and 20 were finally recruited. One-hundred and sixteen employees reporting to their respective HODs were screened of which 100 were finally recruited. The mean (SD) age was 50.03 (5.08) years for the HODs, and 34 (8.68) years for the employees.

4.2. Employee feedback scores

The mean (SD) feedback score of the employees in the control arm was 22.98(7.2) while in the interventional arm, it was 21.82 (6.4) and was not statistically significant (p=0.28). On all the follow-up days, the scores were significantly higher in the interventional group compared to control arm (Table 2). Similarly, in the interventional group, the scores were significantly higher on all the follow-up days compared to baseline (Table 3) while it was not statistically significant in the control group (Table 4).

5. Discussion

We carried out the present study to evaluate the effect of meditation technique on work performance and acceptability (amongst their employees) of HODs at a tertiary care hospital. We observed that our meditation technique to be effective in improving the work performance of the HODs as indicated by their employees.

Meditation is in practice for several thousands of years and was proven to deepen the understanding of inner-self and has been promoted in the modern world for mind relaxation and stress reduction. Meditation is considered a complementary and alternative medicine that should form a component of holistic medicine.[13] Chanting *Mahamantra* has been objectively shown to reduce the stress levels as observed with reduced heart rate, reaction times and reduced serum cortisone levels amongst the professionals that were observed with greater stress.[14] Mindfulness based program such as the one that we evaluated in the present study has been shown to empower individuals and improve their performance in hospital settings.[15] Similarly, in University Hospital workers, after eight weeks of daily mindfulness/relaxation techniques, a significantly reduced perception of stress particularly at work, increased resilience levels, and improved physical and psychological quality of life domains were observed.[16] A study from the US revealed that meditation through online stress management program during their work hours revealed that 31% showed a reduced stress levels, and 28% showed improvement in the vitality (energetic level).[17]

To the best of our knowledge, this is the first study evaluating the combined components in meditation technique. However, the study is limited in being carried out only in one center and we could not control the influence of other concomitant factors. The effect of meditation technique should be explored in individuals working in units that are highly prone for burn-outs such as critical care units and emergency departments.

6. Conclusion

We observed a significant improvement in the work performance of HODs as evaluated by their respective employees through the meditation technique that consisted of breathing exercise and chanting the *mantra.* Studies are needed exploring the effects in different units and for long term.

7. Acknowledgment

The funder of the study had no role in the study design, data collection, data analysis, data interpretation or writing of the report. The corresponding author had full access to all the data in the study and had final responsibility for the decision to submit for publication.

Table 4: Authors' Contributions

Items	First author	Second author	Third author	Fourth author
Conception of the idea	✓	✓	✓	✓
Funding acquisition				
Data collection	✓			
Data curation and analysis	✓			
Data interpretation	✓	✓	✓	✓
Writing the first draft of the manuscript	✓	✓	✓	✓
Revisions and agreement on the final draft	✓	✓	✓	✓

8. Source of Funding

None.

9. Conflict of Interest

None.

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