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ASSESSMENT OF PHYSIOLOGICAL AND PSYCHOLOGICAL WELL BEING IN PRACTITIONERS OF RAJAYOGA MEDITATION.

Physiology

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ABSTRACT

Objective: Present study was conducted to assess the physiological, biochemical and psychological variables in Rajayoga meditators and compare them with those of non-meditators.

Methods: Sixty participants were divided in two groups(n=30 each), group1 included non-meditators and group2 comprised of practitioners of Rajayoga meditation (RYM). Physiological and biochemical variables were recorded. Psychological health was assessed using 21-item depression, anxiety and stress scale(DASS-21).

Results: Meditators showed a significant ($p<0.05$-<001) declining trend in physiological and biochemical parameters as compared to non-meditators.DASS-21 scores were significantly lower ($p<0.001$) in group2 as compared to group1. All the meditators scored within normal range, whereas, nearly one-third to three-fourths of non-meditators scored above the threshold values on DASS-21 subscales.

Conclusion: Considerably high prevalence of psychological morbidity was self-reported by group1 participants. Concomitant physiological and psychological findings indicate that practice of RYM induces mental and physical relaxation, thereby having a beneficial influence on the overall health of an individual.

KEYWORDS

Anxiety, Depression, Rajyoga meditation, Stress.

Introduction

Last couple of decades has witnessed an increasing global trend in the prevalence of psychological morbidity amongst all age-groups and in both genders. A multi-national, multi-centric study conducted by WHO postulated that nearly 121 million people were affected by some form of psychological disorder[1].Despite these alarming reports, mental health continues to represent a neglected public health problem and effective preventive and supportive measures to curb it need to be found.

An emerging body of multidisciplinary studies has put forth evidences in support of the practice of meditation as an alternative measure for not only promoting general sense of well-being and improving the quality of life but also for combating various medical and psychological ailments[2-4]. Raja yoga meditation (RYM) is the art and science of harmonizing spiritual, mental and physical energy through connection with the Supreme Soul and is considered to be one of the most superior forms of meditation technique[5]. It involves using the mind in a natural manner by increasing awareness of the present moment, shifting focus from random negative thoughts and encouraging positive thinking. Although the practice of RYM meditation is not new, however still, there is a paucity of scientific literature.

Hence, the present study was conducted to assess the influence of RYM on the physiological, biochemical and psychological affective variables using cardiovascular parameters, blood sugar estimation and Depression Anxiety Stress Scales-21 (DASS-21) respectively.

Material and methods

This was a cross-sectional observational study, conducted in Department of Physiology, Maulana Azad Medical College, New Delhi. Approval from institutional ethics committee was obtained before commencement.

Study groups

Sixty healthy participants in the age group of 35-60 years were categorized into two groups on the basis of RYM practice. **Group1** included 30 participants (Male:Female=21:9)who were not practicing meditation of any form and were recruited from general population. **Group2** included 30 participants (Male:Female=13:17), who practiced RYM for at least 1 hour/day for 5 days of week, for >1year. They were selected from RYM centre, Dwarka, New Delhi. Participants having history of cardiovascular disease, substance abuse, alcoholism, smoking, psychiatric illness and/or on treatment for psychological problems, or individuals practicing any other kind of relaxation/ meditation technique were excluded from the study.

Study protocol

The participants reported for the study in the RYM centre during the morning hours between 6-7am. Detailed information about the project was given and written informed consent was obtained from all participants. Detailed history, including history of meditation was taken, recording of anthropometric measurements done, followed by a complete general physical examination that also included recording of heart rate and blood pressure. Fasting blood sample was also collected for estimation of blood sugar. The participant's psychological health was assessed using DASS-21.

Physiological Variables: All the cardiovascular parameters were obtained between 6am-7am from the right arm in sitting posture. Heart rate (HR), Systolic (SBP) and diastolic blood pressure (DBP) were recorded by digital automatic blood pressure monitor.Three consecutive readings were obtained and an average value was calculated. Pulse pressure (PP) was calculated by difference in SBP and DBP. Mean arterial blood pressure (MAP) was calculated using the formula: MAP = DBP + 1/3PP.

Biochemical Variables: Fasting blood sugar estimation was done using glucometer as per standards recommended by American Diabetes Association (ADA).

Psychological Variable: DASS-21[6]:

It is a self-reported questionnaire that has 21-items, with 7 questions each for depression, anxiety and stress subscales. Each item is responded on 4-point likert scale ranging from 0(did not apply to me at all) to 3 (applied to me very much or most of the time) over the past month. Scores for identified items of each subscale are summed. Because the DASS-21 is a short version of the DASS (the Long Form has42 items), final score of each item groups (Depression, Anxiety and Stress) is multiplied by two. Higher scores denote greater severity. The severity of the symptoms of Depression, Anxiety and Stress can be graded into normal, mild, moderate, severe and extremely severe based on the scores[6].

Statistical analysis

Statistical analysis was performed using SPSS version 20 for Windows (SPSS Inc.;Chicago,IL, USA).Descriptive statistics in the form of mean± standard deviation (SD) was calculated for the continuous data. Categorical data was expressed as frequency and percent. Cross-tabulation was used to find the frequency and percent of in the participants of the two groups for severity of DASS-21 subscales. Chi-square test was used to measure the association between categorical variables.Difference between means of variables was evaluated using Student's unpaired "t" test. A $p<0.05$ was considered statistically significant.

Results

There was no significant difference (p>0.05) in anthropometric measurements between the two study groups (Table I). Mean duration since Group2 participants had been practicing RYM was 23.63 ±9.35years.

Table I: Distribution of age and anthropometric measurements of participants in two study groups (n=30 in each). Values are Mean±SD.

Variables	Group 1 (Non-meditators)	Group 2 (Meditators)
Age(years)	45.20±8.23	45.33±6.42
Height(cms)	162.17±9.41	162.33±5.53
Weight(kgs)	71.17±11.02	66.12±11.79
BMI(kg/m²)	27.05±3.48	24.99±1.89

Significantly lower values of HR, SBP, MAP (p<0.001), and, DBP and PP (p<0.01) were found in meditators as compared to non-meditators. FBS also showed significantly lower (p<0.05) values in group 2 participants.(Table II).

Table II: Descriptive statistics of physiological and biochemical variables in two groups (n=30 in each). Values are Mean±SD. *p<0.05; **p<0.01, ***p<0.001

Variables	Group 1 (Nonmeditators)	Group 2 (Meditators)
HR(beats/min)	77.83±6.64	70.87±6.71***
SBP(mmHg)	130.07±16.25	112.00±9.97***
DBP(mmHg)	81.53±9.17	73.87±8.83**
PP(mmHg)	48.53±11.35	38.13±12.94**
MAP(mmHg)	97.71±10.74	86.58±6.92***
FBS(mg/dl)	106.80±29.36	94.33±13.96*

HR - Heart Rate, SBP - Systolic Blood Pressure, DBP - Diastolic Blood Pressure, PP - Pulse Pressure, MAP – Mean Arterial Pressure, FBS - Fasting Blood Sugar.

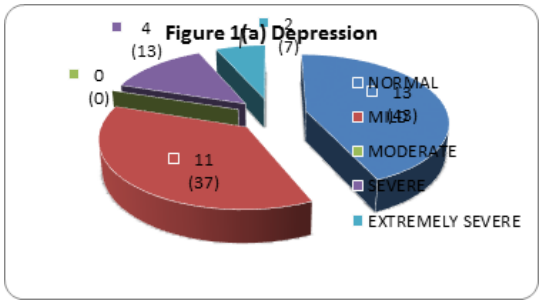
The overall mean±SD scores for DASS-21 are shown in Table III. The scores for all the three subscales of DASS-21 were significantly higher (p<0.001) in the non-meditators as compared to the practitioners of RYM.

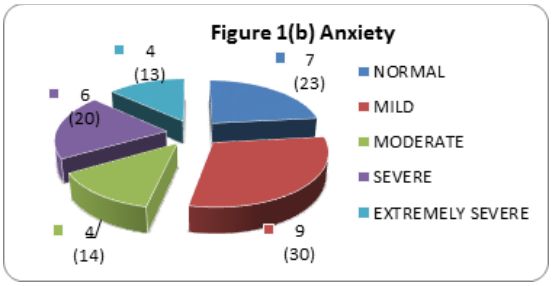
Table III: Descriptive statistics of the three subscales of DASS-21 in two groups(n=30 in each). Values are Mean±SD. ***p<0.001

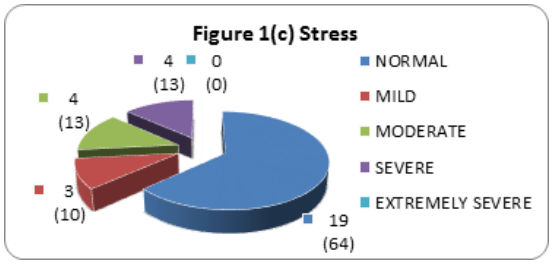
Variables	Group 1 (Non-meditators)	Group 2 (Meditators)
Depression	11.60±7.71	4.73±2.99***
Anxiety	12.93±7.04	2.53±1.89***
Stress	15.13±8.23	3.27±2.13***

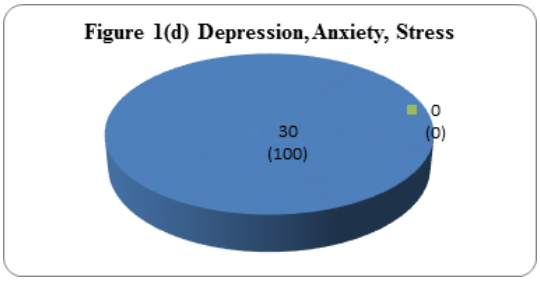
Overall prevalence of symptoms of depression, anxiety and stress amongst group1 participants were 56.7%, 76.7% and 36.7% respectively. Approximately one third (33.3%) of the non-meditators perceived severe or extremely severe anxiety. In the depression and stress subscales, 20% and 13.3% non-meditators respectively self-reported, severe or extremely severe symptoms (Figure 1a-c). All the participants in group 2 scored within the normal range for all three subscales of DASS-21 (figure1d). Chi square test showed that there was a significant association between the severity of symptoms of depression (x2=23.72, p<0.001), anxiety (x2=37.30, p<0.001), and stress subscales (x2=13.47, p<0.01) with RYM.

Figure 1a-d: Severity of (a) Depression, (b) Anxiety and (c) Stress subscales in Group 1 and (d) All 3 DASS-21 subscales in Group 2 participants. (n=30 in each group).Values are frequency(%).









Discussion

The present results show that practice of RYM has a beneficial influence on the overall health of an individual as both the physiological and biochemical variables exhibited a declining trend in Raja yoga meditators as compared to non-meditators. Results further show that there was a significant difference in scoring of psychological variables amongst the two study groups. All the meditators scored within normal range, whereas, nearly one-third to three-fourths of non-meditators scored above the threshold values on one or more DASS-21 subscales, thereby indicating a high prevalence of psychological morbidity amongst them.

In the present study, we assessed physiological, biochemical and psychological variables amongst Raja yoga meditators and compared them with those of non-meditators (who served as controls). Participants of group2 had been practicing RYM for a long duration since, mean duration for the same was found to be more than twenty years in them. All the physiological and biochemical variables were found to be within the normal range in both study groups. However, meditators, in comparison to non-meditators had significantly lower values for these parameters. As participants in both our groups were comparable in terms of age and anthropometric measurements, we can safely attribute these findings to be due to the positive influence of RYM. Our results are in concurrence with previous studies which have shown improvement in cardiovascular parameters following various forms of meditation in hypertensives or in patients suffering from ischemic heart disease[2,7]. Even in normotensive individuals, regular practice of meditation has shown to give significant protection from cardiovascular disorders by reducing ambulatory blood pressure levels[8]. However, few studies have also reported contradictory results. In a study conducted on group of male long term meditators, increase in HR during meditation was observed as compared to the baseline session and also during the non-meditation control sessions[9]. Researchers argued that a single model of sympathetic activation or overall relaxation was inadequate to describe the effects of meditation technique on physiological parameters. Stimulation of parasympathetic nervous system causes depression of sinoatrial node, reduces contractility of heart and produces arteriolar dilatation[10]. Current findings further corroborate the notion of existence of a dual model involving both, activation of parasympathetic system and quietening of sympathetic system. By shifting a balance from sympathetic towards parasympathetic cholinergic outflow, RYM could have led to

a declining trend seen in various physiological parameters like HR and blood pressure of group 2 participants.

Our DASS-21 data illustrated significantly high prevalence of self-reported psychological morbidity amongst non-meditators as compared to the meditation group. Scores for psychological distress symptoms (i.e.depression, anxiety and stress) were above threshold values in more than one-third of the group 1 participants. Furthermore, maximum percentage of these non-meditating participants (76.7%) reported having symptoms of anxiety. Severity of symptoms of anxiety was also highest with almost one-third of the group 1 participants having perceived severe or very severe anxiety. Here it is noteworthy to mention that, all the participants in group 2 had scores within normal range for three subscales of DASS-21. These observations are in conformity with earlier works in which significant improvement in symptoms of patients suffering from different psychological disorders like depression, state trait anxiety or stress have been reported following practice of various meditation techniques[3-5]. RYM has been found to confer beneficial effects on mental well-being of an individual by enabling them to overcome negative thoughts, anger, mental stress and irritability. Some researchers have even gone to the extent of suggesting that this form of meditation technique is more effective than pharmacological treatment of depression and anxiety and, may serve as a cost-effective substitute to medicinal therapy[4]. Nevertheless, RYM does enhance positive thinking and provides happiness in life[5]. Previous research works have shown that focusing on positive self-aspects and having positive emotions not only lowered negative effects[11] but also helped people to come out of depression following aftermath of any crisis in life[12]. Since, RYM involves awareness of the metaphysical self and aims at establishing a balance between head, heart and hand; it might have led to more positive self-perceptions and better functional health of group 2 participants in this study.

Beneficial impact of RYM on mental health and concomitant findings in physiological and biochemical parameters indicates that meditation induced relaxation serves to ameliorate increased arousal and tension. Meditation induced neurochemical changes can produce these effects. Increased secretions of serotonin and endorphins, coupled with increased parasympathetic activity and gaba-minergic drive, contribute to anxiolytic stress relieving effects of meditation. Decreased firing of locus ceruleus with decreased noradrenaline and cortisol secretions also contribute to promoting better health amongst the meditators. Various neuro-imaging studies have confirmed these findings by suggesting that meditation results in an activation of prefrontal cortex, thalamus and inhibitory thalamic reticular nucleus and a resultant functional differentiation of the parietal lobe[13].

Taken together, these current findings provide new insights into the beneficial effects of RYM on physiological and psychological health of an individual. It seems to be a significant modulator of autonomic activity and is indeed one of the most promising alternative technique for transforming ones attitude towards adverse and stressful situations. This would enable its practitioners to cope with everyday stressors of life by mental relaxation, self-management and positive thinking, which would go a long way in promoting and adopting a healthier and more meaningful lifestyle.

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