

Effect of Meditation on Stress in Pharmacy Students: A Potential Observational Study

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ABSTRACT

Objective: To study and examine the effectiveness of Meditation on stress levels of Pharmacy students in a educational environment. **Methodology:** A cross-sectional research using a standard Perceived Stress Questionnaire pertaining to the subjective perception of things in the educational environment leading to emotional stress such as workload, worries, tension, and harassment as well as joyful conditions. Overall 120 students from 1st, 2nd and final years of an Pharmacy college in Rajkot, in the state of Gujarat, India participate in 3 hours (1 hour each day on 3 consecutive days) meditation workshop. **Results:** The predominant themes represented are perceptions of the learning environment and clinical practice, coping, personal issues, balancing college work, and personal life. Mean Baseline stress scores of workload is higher for first and second-year students compared with final year students; Worries and Harassment score is higher in second-year students; Joy score is higher for first-year students; Tension score is higher in final year students. After meditation workshop, the mean decrease in workload, worries, tension and harassment score and mean increase in Joy score is observed in the participants. **Conclusion:** The investigation on the effectiveness of Meditation as a mental and emotional support instrument to deal with and to mitigate stress reveals positive results. Based on these results, it is evident that meditation can be employed as a coping mechanism to deal with stress in an educational environment. Meditation may be considered for inclusion in the standard curriculum of Pharmacy colleges.

Keywords: Stress, Meditation, Pharmacy, Tension, Workload, Worries, Harassment, Joy.

INTRODUCTION

Stress, a Psychological Disorder of the 21st century is usually ignored in day-to-day life due to busy routine. As long as one is alive, there is continually some stress; this positive stress is essential as it inspires and gives physical and emotional strength to perform fine [1].

However, an additional stress leads to harmful effects that manifest in the form of a headache, infections, anger, low self-esteem and stress, weight loss and addiction. Thus, stress effects a change in one's interaction with the surrounding atmosphere which could be at physical, emotional, cognitive, or physiological levels [3]. The World Health Organization (WHO) has projected those stress-related disorders to be one of the leading causes of disability by the year 2020 [4].

Stress among Pharmacy Students

Job stress is very high in the Pharmacy profession. Pharmacy students share similar anxieties as their professional counterparts in a clinical setting; in addition, they also endure stress related to academics, personal and social factors.

Student stress in Pharmacy schools is now a widely accepted problem that negatively affects their performance in academics and clinical duties; adversely affecting their physiological and psychological well-being.

Increasing levels of stress among Pharmacy students have been reported from studies and investigations done in India and the United Kingdom.

Evidence from investigations suggests that Pharmacy students are subjected to highly anxious environments as compared to students from other disciplines like Arts, Commerce etc.

Some studies indicate that initial period of technical education is highly stressful for students; while others show that irrespective of their academic level stress remains high during undergraduate education and training.

Stress Levels at Different Education Levels

In some investigations perceived stress levels decrease according to the year of attendance. Senior student nurses exhibited lower levels of stress compared than junior student nurses. The cause cited was they have become more knowledgeable, more skilled and have adapted to the academic and clinical requirements of the program.

However other investigations reported that stress experienced by nursing students in clinical practice increased as they progressed through the program, second-year students presented higher levels of stress as compared to first-years. In another study conducted on European students, self-reported stress was at the highest during the final year of the program.

The cause of stress alluded to stress associated with work assessment throughout the course, long working hours and work shifts leading to lack of social life; need to act with accuracy in emergency situations as well as exposure to contagious disease. First-year students perceived academic stress more intensively than the other groups. For second and final years other factors such as clinics and external stressors were dominant.

Reasons for Stress among Pharmacy Students

Stress among Pharmacy students is a mixture of various factors. These include academically related workload to be managed with technical duties, high-pressure technical environment, managing relationships at the workstation and at a personal level, having to deal with financial and social responsibilities; lack of relaxation and private time.

Academic-related concerns are mainly high workload, lack of knowledge, assignments, and examinations and adapting to new teaching style; all of these compounding to fear of failure. Adjusting to the high-pressure technical environment with high burdens on attention, low tolerance to mistakes, constant supervision and assessments and fear of placements contribute to a reasonable amount of stress.

Struggling to manage associations with various people in the workplace such as Professors, fellow students, coworkers and other technical professionals; students frequently feel that stress levels, both positive and negative, have gone outside their capacity.

Personal factors such as gender, age, new environments, and trouble in integration into a new system of life, financial Concerns are also a source of stress.

Methods to Circumvent Stress

Yoga and meditation methods have been in use for centuries in clinical settings as methods to decrease pain and to mitigate stress. Discoverers of meditation research such as Harvard's Dr. Herbert Benson ("The Relaxation Response") and Jon Kabat-Zinn, as well as new scientists like Richard Davidson and Sara Lazar uses the tools of modern brain research to discover the effects of meditation on mind and health [28-30].

Over 1000 research articles have been published on the positive effect of meditation on metabolism, blood pressure, brain activation, and other bodily processes. Studies have exposed that meditation effects in a slowdown of heart rate and breathing [31]; blood pressure normalizes, oxygen is used more efficiently. The adrenal glands produce less cortisol, aging of mind decelerates and there is a boost to the immune system [32].

During meditation, the mind is trained to disregard thoughts and become still. Consistent practice clears away the information workload that builds up daily in the mind contributing to stress.

The workout of meditation produces a relaxation response even in subjects who had never practiced meditation before. It results in the physiological stress responses without taking away the advantageous effect of stress, the namely improved performance of cognitive tasks and memory; In fact, it can converse our stress response, deterring the progress to a chronic stress condition.

Raja Yoga meditation eases physiological and psychological stress and restores mental harmony if practiced on a consistent basis; it is a compliment for promoting and maintaining physical, mental, and spiritual health [33].

Meditation used in this study is a simplified form of Raja Yoga where a practitioner meditates on the heart. This technique involves regulation of mind by ignoring undesirable thoughts during meditation. There is no concentration involved during meditation. When one tunes the mind to the heart, sensitivity improves, and one goes from just Thinking to feeling" resulting in becoming more intuitive, more delicate, and hence more compassionate.

MATERIALS AND METHODS

Participants

The study was conducted in a Pharmacy college in Rajkot. Total 120 students from 1st, 2nd and final years participate voluntarily in a 3-hour (1 hour each day over 3 consecutive days) meditation workshop.

Ethical Considerations

Approval was sought from the institutional authorities before conducting the study. All the participants were assured about confidentiality of this research. Signed consent was taken from the participants before data collection.

Methodology

A standard preformats was used consisting of a demographic profile of the participants and perceived stress scale [34]. This scale consists of 30 questions covering feeling of joy and different sources of stress such as workload, worries, tension, and harassment. Each question to be responded in a 4-point Likert scale arranged from strongly disagree (1) to strongly agree (4).

Data Collection

Meditation session led by a qualified trainer was conducted for three consecutive days. The questionnaire was given before the first session and after the last session of meditation. In order to elicit a impulsive response, the survey method was shared just before the questionnaire is handed over.

Data Analysis

Out of 120 responses submitted, the data from 90 students was analyzed leaving aside incomplete data and those without the signed consent of participation. Frequencies of variables such as age, sex and stress type were calculated. Chi-square analysis was performed to analyze the relationships among the variables and subscales such as workload, worries, tension, harassment, and joy. The assimilated details were entered in the statistical package of social sciences (SPSS), version 19. Data was conferred using inferential and descriptive statistics in the pattern of numbers, percentages, and frequencies and crosstabs. The t-test was used to find out the means and standard deviation.

RESULTS

Demographic Profile

Of the 90 participants, 74 (81.3%) were female and the rest 16 (17.78%) were male; 13 (14.3%) were fresher's, 60 (65.9%) were second-year Pharmacy students and the rest 18 (18.88%) were 4th year Pharmacy students. Complete demographic profile of participants is represented in Table 1.

Level of Stress and Common Stressors

Mean values of baseline and after meditation stress scores of Pharmacy students were assessed using one sample t- test for the subscales workload, worries, joy, tension, and harassment. As seen in Table 2 and Figure 2, there is a mean increase in joy and a mean decrease in all the other parameters in participants as a result of meditation.

Table 1 Profile of participating students

Demographic characteristics		Number	Percentage
Gender	Female	74	81.30%
	Male	16	17.78%
Year of Students	1st Year	13	14.30%
	2nd Year	60	65.90%
	Final Year	17	18.88%

Table 2 Baseline and after meditation stress scores of Pharmacy students

Stress scores		N	Mean	SD	SEM
Workload	Pre-meditation	90	23.82	4.767	0.50
	Post-meditation	90	22.77	5.455	0.572
Worries	Pre-meditation	90	17.14	4.552	0.477
	Post-meditation	90	16.62	4.95	0.519
Joy	Pre-meditation	90	14.51	4.285	0.449
	Post-meditation	90	14.95	3.993	0.419
Tension	Pre-meditation	90	20.22	4.821	0.505
	Post-meditation	90	19.08	4.583	0.48
Harassment	Pre-meditation	90	10.11	3.545	0.372
	Post-meditation	90	8.79	2.401	0.252

SD: Standard Deviation; SEM: Standard Error of the Mean

Mean values of baseline and after-meditation stress subscales of Pharmacy students are compared. There is a mean decrease in workload, worries, tension and harassment scores and mean increase in joy score after meditation compared with that of Baseline. This difference reached statistical significance in the case of tension and harassment scores (Table 3).

Table 3 Comparison of stress scores between baseline and after-meditation of Pharmacy students

Stress scores	Mean	SD	SEM	Confidence interval of the difference		t	df	Significance
				Lower	Upper			
Pre- and Post-meditation workload	1.055	6.555	0.687	0.31	2.42	1.535	90	0.128
Pre- and Post-meditation worries	0.527	5.695	0.597	0.659	1.713	0.884	90	0.379
Pre- and Post-meditation joy	0.44	5.11	0.536	1.504	0.625	0.821	90	4.414
Pre- and Post-meditation tension	1.143	5.409	0.567	0.016	2.269	2.016	90	0.047*
Pre- and Post-meditation harassment	1.319	4.002	0.420	0.485	2.152	3.143	90	0.002*

Paired sample t-test; * Significant; SD: Standard Deviation; SEM: Standard Error of the Mean

In 1st year Pharmacy students, there is mean decrease in workload, worries, tension, and harassment score after meditation compared with that of baseline whereas, and joy score remains the same (Table 4).

Table 4 Mean stress scores between baseline and after-meditation of 1st year Pharmacy students

Stress scores		N	Mean	SD	SEM
Workload	Pre-meditation	13	24.00	3.266	0.906
	Post-meditation	13	22.77	6.405	1.776
Worries	Pre-meditation	13	16.62	5.124	1.421
	Post-meditation	13	16.00	4.619	1.281
Joy	Pre-meditation	13	16.00	0.00	0.00
	Post-meditation	13	16.00	4.619	1.281
Tension	Pre-meditation	13	19.69	5.282	1.465
	Post-meditation	13	17.85	3.508	0.973
Harassment	Pre-meditation	13	9.23	3.004	0.833
	Post-meditation	13	8.62	2.219	0.615

SD: Standard Deviation; SEM: Standard Error of the Mean

In 2nd year nursing students, there is mean decrease in workload, worries, tension, and harassment score and increase in joy score after meditation compared with that of baseline (Table 5).

Table 5 Mean stress scores between baseline and after-meditation of 2nd year Pharmacy students.

Stress scores of Year 2nd students		N	Mean	SD	SEM
Workload	Pre-meditation	60	24.00	4.885	0.631
	Post-meditation	60	22.80	5.477	0.707
Worries	Pre-meditation	60	17.33	4.209	0.543
	Post-meditation	60	16.80	5.038	0.650
Joy	Pre-meditation	60	14.00	4.570	0.590
	Post-meditation	60	14.40	3.841	0.496
Tension	Pre-meditation	60	20.40	4.979	0.643
	Post-meditation	60	19.07	4.679	0.604
Harassment	Pre-meditation	60	10.53	3.753	0.484
	Post-meditation	60	8.80	2.420	0.312

SD: Standard Deviation; SEM: Standard Error of the Mean

In final year Pharmacy students, there is mean decrease in workload, worries, and harassment score and increase in Joy score whereas tension score remains the same at baseline as well as after meditation (Table 6).

Table 6 Mean stress scores between baseline and after-meditation of final year Pharmacy students.

Stress scores of Final Year students		N	Mean	SD	SEM
Workload	Pre-meditation	17	23.11	5.411	1.275
	Post-meditation	17	22.67	4.947	1.166
Worries	Pre-meditation	17	16.89	5.411	1.275
	Post-meditation	17	16.44	5.113	1.205
Joy	Pre-meditation	17	15.11	4.664	1.099
	Post-meditation	17	16.00	3.881	0.915
Tension	Pre-meditation	17	20.00	4.116	0.970
	Post-meditation	17	20.00	4.947	1.166
Harassment	Pre-meditation	17	9.33	3.068	0.723
	Post-meditation	17	8.89	2.587	0.610

SD: Standard Deviation; SEM: Standard Error of the Mean

DISCUSSION

In a demographic profile of over 70% female participants, there is no significant difference in the gender wise response. Both female and male participants report reduction in perceived stress post-meditation (Figure 1).

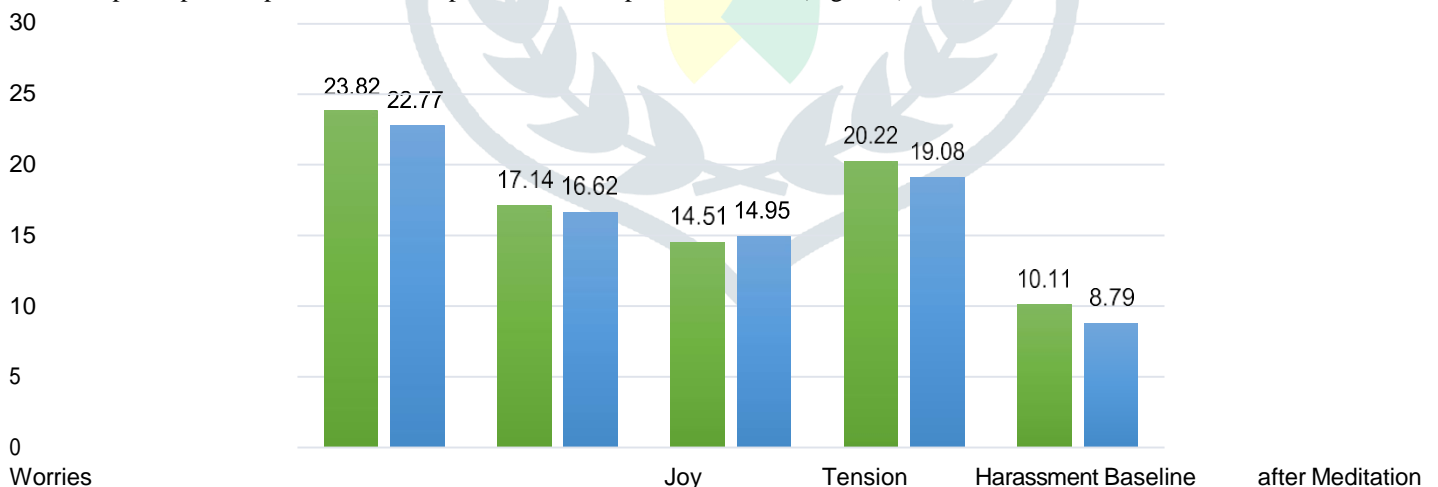


Figure 1 Comparison of mean stress scores between baseline and after-meditation of nursing students

In a participant base consisting of over 60% of second years, from the baseline studies, workload appears to be the highest stressor followed by tension and then worries. Harassment score is relatively less as compared to other subscales.

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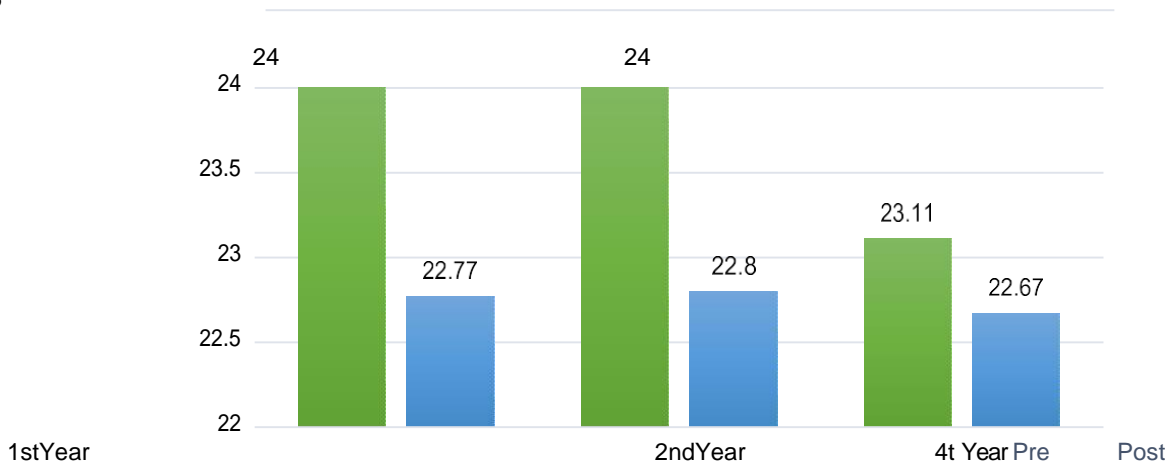


Figure 2 Effect of meditation on workload scores

This could be because the students are weighed down by either academic or technical work or both, particularly in the first and second years. The reason attributed is the process of acquiring skills and knowledge in a new learning atmosphere. The higher the stressor the more benefit observed as a result of meditation as seen in the baseline and post-meditation scores in the Figure 2.

Response to Various Subscales on Participants of Different Levels

As seen in the Figure 2 above, workload is perceived to be higher among first and second-year students as compared to final year students. In the case of fresher’s who are mostly coming straight from schools, exposure to a new subject,



New education environment and new technique of teaching is a challenge. Hence academic workload is a big stressor among first-year students. As students come from different walks of life; some of them come from townships where the medium of instruction is not English; trying to understand and assimilate course content in a close-fitting schedule and the language barrier becomes a further challenge.

Stress due to workload is higher for first and second-year students compared with final-year students. This is due to the fact that they are not used to managing clinical alongside academic load and multitasking between them. Also, the knowledge level is lower, and time taken to understand and comprehend is much higher compared to other classes.

In the second year, though students get accustomed to the academic load, they still feel challenged due to lack of knowledge and skills as they take up specialization subjects. Additionally, they get involved in clinical duties and practical work. Since most of the time consuming low-end clinical duties are performed by second-year students; the volume of work gets higher.

Post-meditation, participants would have experienced a clearer mind and a sense of calmness. Even a short session of meditation stabilizes the emotional state and the individual feels more grounded. For nursing students, there is a need to balance various kinds of work without getting overwhelmed. Meditation induces a sense of inner confidence and strength as one becomes calm and emotionally grounded. Therefore, students from all levels of education have uniformly felt less challenged post-meditation (Figure 3).

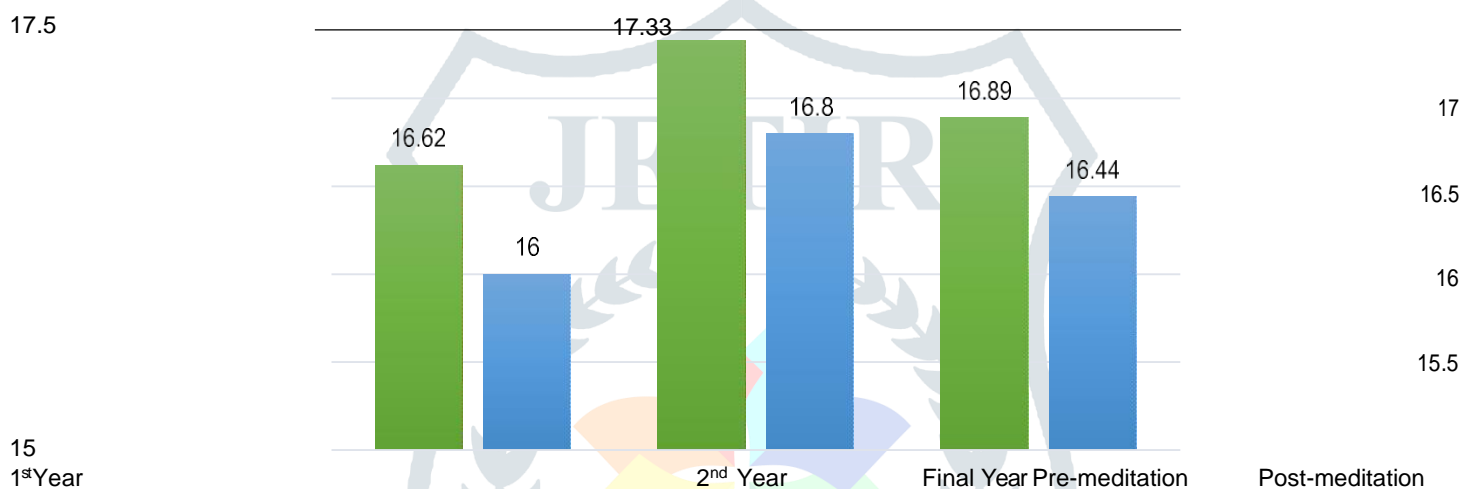


Figure 3 Effect of meditation on worries scores

Worries are higher in second-year students as they are actually exposed to the clinical environment and due to initial lack of knowledge and skills, they are most likely not able to get things right. Being unfamiliar with the clinical environment they are probably uncertain as to where to seek help. The worry also due to the trails of having to manage relationships with new people such as staff, coworkers and for some there could be personal and financial problems that persist. Cause of stress could also be due to a perception of their being unsuitable for the job in hand and the apprehension that the situation would become tougher in the future.

A short session of meditation clears the mind of disturbing thoughts and relaxes the mind as it gets tuned to the present moment. Thus, the effect of stress and nervous tension is minimized as seen from the graph. Long-term practice would have improved their cognitive ability and problem solving which will dispense the worrying thoughts of low self-worth and fear of failure.

Tension builds up in the second year and manifests itself in communication, mental and physical fatigue, and inability to relax. This could be a result of longer working hours and shifts and also lack of social life due to tight work schedule. It may be that the volume of tasks and activities taken on exceeds their capacity to comfortably handle associated stress (even the positive stress).

Sometimes mental exhaustion can be a result of health issues. Depression, heart disease, chronic illness and autoimmune disease can all lead to insomnia or trouble sleeping leading to mental fatigue.

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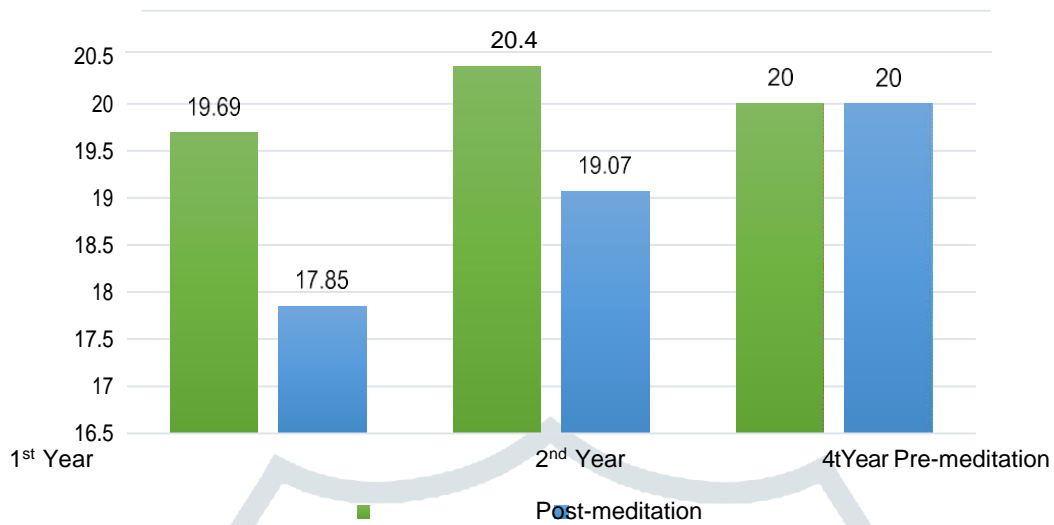


Figure 4 Effect of meditation on tension scores

Tension makes one difficult to concentrate and also succumb to moods. Final year students have higher responsibilities and there is also the concern about preparing for job placements as well as need to manage relationships across various persons they interact with, having to take more responsibilities such as mentoring a junior as well as being accountable for complex cases adds to the tension (Figure 4).

In final year students, effect of meditation is not observed in tension scores. Possibly they need more time to relax as compared to first and second year students. Regular meditation should help.

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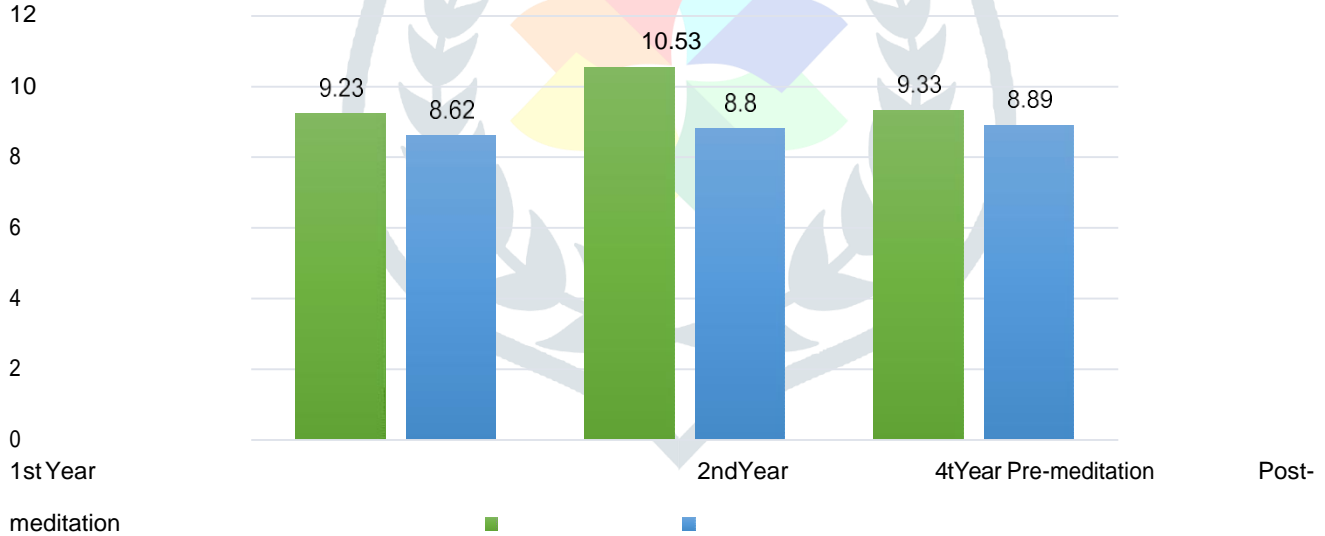


Figure 5 Effect of meditation on harassment scores

Though some tolerance is given to first year students, however for second year students are expected to perform better, Therefore there is less tolerance for errors (Figure 5).

Criticism in front of others when mistakes are made, fault finding, verbal abuse etc. can contribute to deep impressions of low self-worth sometimes leading to emotional trauma, lack of sleep and inability to focus. To be treated with dignity and respect matters to all individuals [16].

One of the components of meditation is cleaning and removal of negative impressions, and false perceptions in trainer-led sessions. This would have resulted in a short-term relief due to the purging of negative thoughts that arise out of these impressions and perceptions stored in the subconscious mind (Figure 6).

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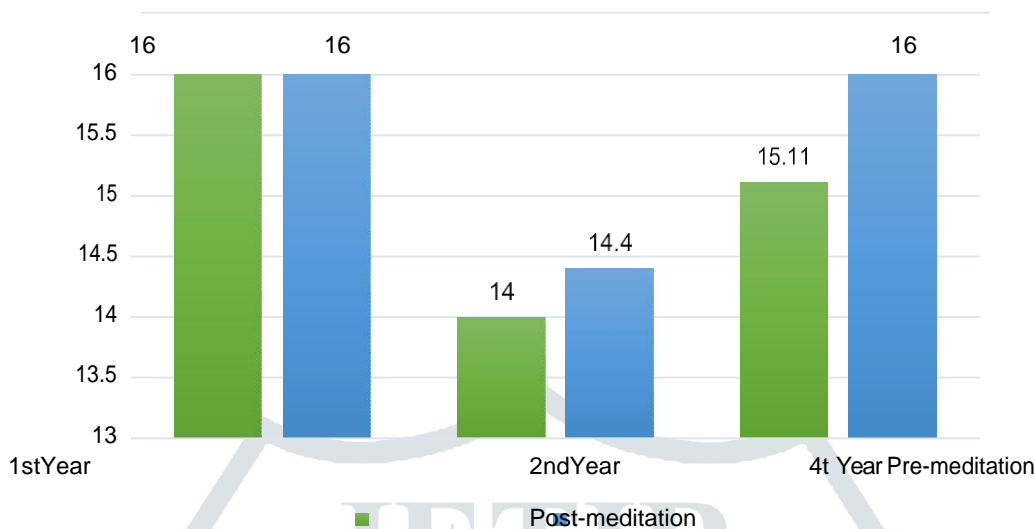


Figure 6 Effect of meditation on Joy scores

Joy is an emotion that usually results from circumstances like success, good fortune, and love. A mind that is in a state of joy is predisposed to notice and preferentially attend to that which is beautiful, wholesome, pleasant, and satisfying, while at the same time tending to disregard that which is otherwise. The perceptions that arise in a joyful mind will tend to emphasize the positive aspects of whatever is attended to (Figure 6).

Meditation awakens the feeling of unconditional inner joy which cannot be averted by guilt, shame, doubt, uncertainty, insecurity, and fear of losing. Meditation produces the internal sense of gratitude in being alive and gladdens the heart. This makes the person become more kindhearted.. In our study, joy scores have increased post-meditation in second year as well as final year students. This should certainly increase their performance in their academics as well as in their private lives. In first year students, joy scores are already higher at the baseline compared to the rest probably because they have not yet entered their training in full swing. And hence, it did not change much after meditation.

CONCLUSION

Meditation is an established therapy to reduce stress. In addition to reducing stress, meditation also helps nursing students to become more intuitive and sensitive to their surroundings. As the mind becomes calm and tuned with the heart, one develops inner confidence, becomes more grounded and learns to balance work.

The short-term benefit is apparent in this study. But, making a person settled in the regular practice of meditation is the challenge given the tight schedule and timeline. Hence, a serious consideration of inclusion of meditation and meditative techniques as part of the nursing curriculum should be made. meditation is particularly tuned to the needs of modern life and offers a bundle of benefits in addition to relaxation including cleaning the subconscious mind of unwanted impressions that create mind clutter and channeling the mind to the goal through a prayerful attitude of introspection.

People who are free of work stress are the ones who have achieved a balance in their life where they understand their limitations, their strengths, and their interests in a manner which helps them in regulating their workflow. In order to achieve the balance, one needs to have the physical energy, clarity of thought, positive outlook and good quality sleep. Physical relaxation and mind regulation technique in meditation addresses the burden of excessive

Thinking leading mental and physical fatigue and lack of sleep. Since meditation involves tuning the mind to the heart, both working in harmony and joy at work are brought about leading better empathy, and compassion which is very critical for caregivers. Tuning with the heart also develops one's sense of intuition and creativity. With the development of these abilities a person makes fewer mistakes and develops an acute sense of awareness to the surroundings. The benefits of meditation put together can help a nursing student develop the strength and endurance to transition through a difficult period in the Pharmacy college and be a source of inspiration to oneself and others.

DECLARATIONS

Conflicts of Interest

The authors and planners have disclosed no potential conflicts of interest, financial or otherwise.

Acknowledgement

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