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Effectiveness Of Mindfulness Meditation On Perceived Stress And Coping Strategies Among B.Sc Nursing Students In Kanchipuram District: A Randomized Controlled Trial.

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A B S T R A C T

Nursing students often experience high levels of stress during their education and clinical training, which can negatively impact their academic performance and wellbeing. Managing stress and maintaining mental health require effective coping strategies for these students. Many populations, including nursing students, have shown that mindfulness meditation reduces stress and improves coping strategies. Objectives of the present study to evaluate the impact of mindfulness meditation on perceived stress among B.Sc nursing students in the context of a B.Sc Nursing program in Kanchipuram District, specifically examining changes in overall stress levels and stress in various domains, including academic, teaching, social, and interpersonal stress. To determine the effectiveness of mindfulness meditation in enhancing coping strategies, including time management, relaxation, positive thinking, decision-making, and problem-solving skills among nursing students.

The study consisted of 40 nursing students in two groups, a control group and a study group. A paired t-test and a chi-square test were used to analyze the data in the study. Study results showed that mindfulness meditation significantly reduced perceived stress levels and improved coping strategies among the study group when compared to the control group. Among nursing students, mindfulness meditation might be beneficial in managing stress, according to the results of the study.

Keywords*: Mindfulness Meditation, Perceived Stress, Coping Strategies, Nursing Students, Randomized Controlled Trial.*

INTRODUCTION

Students in nursing often feel stressed because of the high demands of their education and clinical training. It is known that high levels of perceived stress can negatively affect students' academic performance and well-being. For these students to manage stress and maintain their mental health, effective coping strategies are crucial. Many populations, including nursing students, have found that mindfulness meditation reduces stress and improves coping strategies. The perception of stress refers to an individual's thoughts or feelings about how much stress they are experiencing at a given time. It differs significantly from individual to individual depending on their experiences and coping mechanisms. Due to academic pressure, clinical responsibilities, and the emotional demands of patient care, nursing students commonly experience high levels of stress [1,2] Psychological and behavioral coping strategies help people cope with stressful events by mastering, tolerating, reducing, or minimizing them. Students must be able to cope effectively with stress and avoid by learning effective coping strategies. [3] By practicing mindfulness meditation, one focuses his or her attention on the present moment while calmly acknowledging and accepting the feelings, thoughts, and physical sensations that arise. The benefits of meditation include reducing stress, anxiety, and depression and improving overall mood [4] Practicing mindfulness meditation can help nursing students develop effective coping mechanisms and manage stress. The purpose of this study is to assess perceived stress levels and coping strategies among B.Sc Nursing students in Kanchipuram District, and to evaluate mindfulness meditation's effectiveness in this setting.

Objectives

- To evaluate the impact of mindfulness meditation on perceived stress among B.Sc nursing students in the context of a B.Sc Nursing program in Kanchipuram District, specifically examining changes in overall stress levels and stress in various domains, including academic, teaching, social, and interpersonal stress.
- To determine the effectiveness of mindfulness meditation in enhancing coping strategies, including time management, relaxation, positive thinking, decision-making, and problem-solving skills among nursing students.

Methodology

Research Design: The study utilized a randomized controlled trial design, to assess the effectiveness of mindfulness meditation on perceived stress and coping strategies among B.Sc nursing students. A total of 40 nursing students were selected as sample for this study and were divided into study and control groups with 20 subjects in each group. A paired t-test and a chi-square test were used to determine whether the intervention had a significant effect on stress and coping skills. Informed consent were collected from the subjects and the ethical clearance was obtained from Institutional Ethical Committee (No.372/2021/IEC/ACSMCH).

RESULTS

In the following table, the demographic variables of nursing students are analyzed using Chi-square tests

Table 1: Distribution of Demographic Variables among Nursing Students

Demographic variables	Study group (n=20)		Control group (n=20)		Chi-Square and p value
	No.	%	No.	%	
1. Age in years					$\chi 2 = 1.129$
a. ≤ 18 years	6	30.0	9	45.0	d.f =2
b. 19 years	4	20.0	4	20.0	p= 0.569 (N.S)
c. ≥ 20 years	10	50.0	7	35.0	
2. Religion					$\chi 2 = 0.902$
a. Hindu	12	60.0	9	45.0	d.f =1
b. Christian	8	40.0	11	55.0	p= 0.342 (N.S)
3. Year of Education					$\chi 2 = 0.000$
a. I year	5	25.0	5	25.0	d.f = 3
b. II year	5	25.0	5	25.0	p= 1.000 (N.S)
c. III year	5	25.0	5	25.0	
d. IV year	5	25.0	5	25.0	
4. Parents Occupation					$\chi 2 = 1.667$
a. Cooli	9	45.0	9	45.0	d.f =4
b. Farmer	6	30.0	6	30.0	p= 0.797 (N.S)
c. Driver	1	5.0	3	15.0	
d. Salesman	2	10.0	1	5.0	
e. Others	2	10.0	1	5.0	
5. Residence					$\chi 2 = 0.404$
a. Rural	8	40.0	10	50.0	d.f = 1
b. Urban	12	60.0	10	50.0	p=0.525 (N.S)
6. Order of sibling					$\chi 2 = 0.432$
a. 1st	10	50.0	12	60.0	d.f =2
b. 2nd	9	45.0	7	35.0	p= 0.806 (N.S)

c. 3rd	1	5.0	1	5.0	
7. Hr. Sec. marks a. <400 b. ≥ 400	 10 10	 50.0 50.0	 8 12	 40.0 60.0	$\chi 2 = 0.404$ d.f =1 p= 0.525 (N.S)
8. Medium School a. Tamil b. English c. Malayalam	 9 10 1	 45.0 50.0 5.0	 16 4 0	 80.0 20.0 0.0	$\chi 2 = 5.531$ d.f =2 p= 0.063 (N.S)

Table 2: Descriptive statistics for Stress in different Domains among Nursing Students for Study and Control Group in Pretest and Post test

	TEST	GROUP	MEAN	STANDARD DEVIATON	't' VALUE Independent -t test	'p' VALUE
Academic	Pre test	Experimental group	44.40	2.35	t = 0.707	p= 0.484 (N.S)
		Control group	44.95	2.56		
	Post Test	Experimental group	22.65	5.82	15.587	0.000 ***
		Control group	44.90	2.61		
Teaching and learning	Pre test	Experimental group	44.20	3.25	0.939	0.354 (N.S)
		Control group	45.10	2.79		
	Post Test	Experimental group	21.20	5.62	16.998	0.000 ***
		Control group	45.05	2.78		
Social	Pre	Experimental group	41.80	3.05	1.006	0.321 (N.S)

	test	Control group	42.95	4.10		
	Post Test	Experimental group	21.05	5.30	14.627	0.000 ***
		Control group	42.95	4.10		
Interpersonal and intrapersonal	Pre test	Experimental group	30.00	2.29	0.780	0.440 (N.S)
		Control group	30.70	3.29		
	Post Test	Experimental group	22.65	5.82	5.380	0.000 ***
		Control group	30.70	3.29		
Group Activities	Pre test	Experimental group	42.00	5.62	1.352	0.184 (N.S)
		Control group	43.95	3.17		
	Post Test	Experimental group	22.65	5.82	14.365	0.000 ***
		Control group	43.95	3.17		
Derive and desire	Pre test	Experimental group	34.75	2.99	0.337	0.738 (N.S)
		Control group	34.50	1.43		
	Post Test	Experimental group	22.65	5.82	8.835	0.000 ***
		Control group	34.50	1.43		
Overall Stress	Pre test	Experimental group	237.15	10.65	1.547	0.130 (N.S)
		Control group	242.15	9.77		
	Post	Experimental group	132.85	33.90	13.830	0.000 ***

	Test	Control group	242.05	9.87		

Note: N.S. - Not Significant

Table 3: Distribution of Level of Overall Stress among Nursing Students for Study and Control Group in Pre-test and Post test

Level of Stress	Pre test				Post test			
	Study group (n = 20)		Control group (n = 20)		Study group (n = 20)		Control group (n = 20)	
	No.	%	No.	%	No.	%	No.	%
Mild stress	0	0.0	0	0.0	1	5.0	0	0.0
Moderate stress	0	0.0	0	0.0	10	50.0	0	0.0
Severe Stress	4	20.0	0	0.0	9	45.0	0	0
Very severe stress	16	80.0	20	100.0	0	0.0	20	100.0
Chi-square test and p value	$\chi 2 = 4.444$, d.f =1, p= 0.106(NS)				$\chi 2 = 40.00$, d.f =3, p= 0.000 ***			

Table: 4 Descriptive statistics for Coping in different Domains among Nursing Students for Study and Control Group in Pretest and Post test

Different domains on Coping	TEST	GROUP	MEAN	STANDARD DEVIATON	't' VALUE Independent - t test	'p' VALUE
T ime management	Pre test	Experimental group	34.20	3.97	t = 0.999	p= 0.324 (N.S)
		Control group	35.35	3.28		
	Post Test	Experimental group	24.90	6.23	3.874	0.000 ***
		Control group	30.90	3.02		
Relaxation	Pre	Experimental	25.35	3.66	5.296	0.000 ***

	test	group				
		Control group	17.70	5.32		
	Post Test	Experimental group	35.95	3.02	13.341	0.000 ***
		Control group	17.70	5.32		
Positive thinking	Pre test	Experimental group	17.70	5.32	0.00	1.00 (N.S)
		Control group	17.70	5.32		
	Post Test	Experimental group	36.40	3.05	13.633	0.000 ***
		Control group	17.70	5 .32		
D Decision making & problem solving	Pre test	Experimental group	17.70	4.69	0.00	1.00 (N.S)
		Control group	17.70	5.32		
	Post Test	Experimental group	36.40	2.60	15.586	0.000 ***
		Control group	17.70	4.69		
Ventilation	Pre test	Experimental group	17.70	4.69	0.00	1.00 (N.S)
		Control group	17.70	5.32		
	Post Test	Experimental group	34.65	4.03	11.355	0.000 ***
		Control group	17.70	5.32		
Overall Coping	Pre test	Experimental group	112.65	15.88	1.071	0.292 (N.S)
		Control group	106.15	22.02		

	Post Test	Experimental group	168.30	8.68	12.671	0.000 ***
		Control group	101.70	21.84		

Note: ***- p<0.001 Level of Significant

Table:5 Distribution of Level of Overall Coping among Nursing Students for Study and Control Group in Pre-test and Post test

Level of Coping	Pre-test				Post test			
	Study group (n = 20)		Control group (n = 20)		Study group (n = 20)		Control group (n = 20)	
	No.	%	No.	%	No.	%	No.	%
Low coping	0	0.0	0	0.0	0	0.0	0	0.0
Moderate coping	0	0.0	0	0.0	0	0.0	10	50.0
Good coping	5	25.0	9	45.0	1	5.0	10	50.0
Excellent coping	15	75.0	11	55.0	19	95.0	0	0.0
Chi-square test and p value	$\chi 2 = 1.758$, d.f =1, p= 0.320 (N.S)				$\chi 2 = 46.083$, d.f =3, p= 0.000 ***			

Note: ***- p<0.001 Level of Significant

Table: 6 Effectiveness of Intervention on Stress in different Domains among Nursing Students for Study Group And Control Group

Different domains on Stress	GROUP	Mean	Standard Deviaton	'Paired t test	'p' VALUE
Academic	Study group	21.75	5.83	t = 16.685	p= 0.000 ***
	Control Group	0.05	0.22	1.00	0.330 (N.S)
Teaching and learning	Study group	23.00	6.03	17.068	0.000 ***
	Control	0.05	0.22	1.00	0.330

	Group				(N.S)
Social	Study group	20.75	5.02	18.467	0.000 ***
	Control Group	No change	-	Not applicable	Not applicable
In Interpersonal and intrapersonal	Study group	7.35	5.97	5.508	0.000 ***
	Control Group	No change	-	Not applicable	Not applicable
Group Activities	Study group	19.35	8.26	10.476	0.000 ***
	Control Group	No change	-	Not applicable	Not applicable
Derive and desire	Study group	12.10	6.31	8.580	0.000 ***
	Control Group	No change	-	Not applicable	Not applicable
Overall Stress	Study group	104.30	33.09	14.095	0.000 ***
	Control Group	0.10	0.45	1.00	0.330 (N.S)

Note: N.S. - Not Significant; *** - p<0.001 Level of Significant

Table: 7 Effectiveness of Intervention on Coping in different Domains among Nursing Students for Study Group and Control group

Different domains on Coping	GROUP	Mean	Standard Deviaton	'Paired t test	'p' VALUE
Time management	Study group	-9.30	7.52	5.531	0.000 ***
	Control Group	-4.45	0.51	38.99	0.000 ***
Relaxation	Study group	10.60	3.87	12.244	0.000 ***
	Control	No change	-	Not	Not

	Group			applicable	applicable
Positive thinking	Study group	18.70	5.50	15.213	0.000 ***
	Control Group	No change	-	Not applicable	Not applicable
Decision making & problem solving	Study group	18.70	4.97	16.811	0.000 ***
	Control Group	No change	-	Not applicable	Not applicable
Ventilation	Study group	16.95	6.09	12.445	0.000 ***
	Control Group	No change	-	Not applicable	Not applicable
Overall Coping	Study group	55.65	20.78	11.979	0.000 ***
	Control Group	-4.45	0.51	38.99	0.000 ***

Note: N.S. - Not Significant; *** - p<0.001 Level of Significant

Table: 8 Comparison of effective score on Stress in different Domains among Nursing Students between Study and Control Group

Different domains on Stress	Study group (n = 20)		Control group (n = 20)		Independent t test and p value
	Mean	SD	Mean	SD	
Academic	21.75	5.83	0.05	0.22	t = 16.634; p= 0.000 ***
Teaching and learning	23.00	6.03	0.05	0.22	t = 17.020; p= 0.000 ***
Social	20.75	5.02	0.00	0.00	t = 18.467; p= 0.000 ***
Interpersonal and intrapersonal	7.35	5.97	0.00	0.00	t = 5.508; p= 0.000 ***
Group Activities	19.35	8.26	0.00	0.00	t = 10.476; p= 0.000 ***
Derive and desire	12.10	6.31	0.00	0.00	t = 8.580; p= 0.000 ***

Overall Stress	104.30	33.09	0.10	0.45	t = 14.081; p= 0.000 ***

Note: N.S. - Not Significant; *** - p<0.001 Level of Significant

Table: 9 Comparison of effective score on Coping in different Domains among Nursing Students between Study and Control Group

Different domains on Coping	Study group (n = 20)		Control group (n = 20)		Independent t test and p value
	Mean	SD	Mean	SD	
Time management	-9.30	7.52	-4.45	0.51	t = 2.878; p= 0.007
Relaxation	10.60	3.87	0.0	0.0	t = 12.244; p= 0.000 ***
Positive thinking	18.70	5.50	0.0	0.0	t = 15.213; p= 0.000 ***
Decision making & problem solving	18.70	4.97	0.0	0.0	t = 16.811; p= 0.000 ***
Ventilation	16.95	6.09	0.0	0.0	t = 12.445; p= 0.000 ***
Overall Coping	55.65	20.78	-4.45	0.51	t = 12.933; p= 0.000 ***

Note: N.S. - Not Significant; *** - p<0.001 Level of Significant

Based on the age distribution of students in both the study and control groups, the majority were under 20 years old. The study group included 30% of people who were 18 or younger, 20% of people who were 19 years old, and 50% of people who were 20 years or older. 45% of the participants in the control group were 18 years or younger, 20% were 19 years old, and 35% were 20 years or older. There is no significant difference in age between the two groups based on the chi-square test. ($\chi^2 = 1.129$, $p = 0.569$). 60% of the study group was Hindu and 40% was Christian, while 55% of the control group was Christian. Chi-square test results reveal no significant differences between groups based on religious composition. ($\chi^2 = 0.902$, $p = 0.342$). In each group, 25% of students were in the first year, followed by 25 percent in the second year, third year, and fourth year. The chi-square test confirmed no significant difference in this variable ($\chi^2 = 0.000$, $p = 1.000$). The occupation of parents varied across categories such as cooli, farmer, driver, salesman, and others, with no significant differences between the study and control groups ($\chi^2 = 1.667$, $p = 0.797$). There were no rural residents in the study group and 60% in the control group, compared with 50% in both. In terms of residence distribution, there was no significant difference. ($\chi^2 = 0.404$, $p = 0.525$). Students were mostly either first- or second-generation, with similar distributions between the two groups. The results did not show any significant differences. ($\chi^2 = 0.432$, $p = 0.806$). In the study group, 50% of the students scored under 400 and 40% of the control group scored 400 or higher. The study group's medium of instruction during school was Tamil for 45%, English for 50%, and Malayalam for 5%. The control group consisted of 80% Tamil speakers, 20% English speakers, and none

Malayalam speakers. There was an approach to significance for this variable. ($\chi^2 = 5.531$, $p = 0.063$). It was not found that there was a significant difference between the groups in their pre-test scores. Post-intervention, the experimental group demonstrated a significant reduction in stress levels across all domains, including academic ($t = 15.587$, $p < 0.001$), teaching and learning ($t = 16.998$, $p < 0.001$), social ($t = 14.627$, $p < 0.001$), interpersonal and intrapersonal ($t = 5.380$, $p < 0.001$), group activities ($t = 14.365$, $p < 0.001$), and derive and desire ($t = 8.835$, $p < 0.001$). There was no significant difference between the control and meditation groups, which indicates that mindfulness meditation is effective. There were 20% of study participants with severe stress and 80% with very severe stress before the intervention. In the post-intervention period, the distribution of mild stress decreased to 5%, moderate stress to 50%, and severe stress to 45%. ($\chi^2 = 40.00$, $p < 0.001$). The coping strategies of the groups did not differ significantly before intervention. There was significant improvement in all coping domains of the experimental group post-intervention, including time management ($t = 3.874$, $p < 0.001$), relaxation ($t = 13.341$, $p < 0.001$), positive thinking ($t = 13.633$, $p < 0.001$), decision making and problem solving ($t = 15.586$, $p < 0.001$), and ventilation ($t = 12.445$, $p < 0.001$). These domains showed no significant change in the control group. During the intervention period, all students had coping skills in the moderate-to-excellent range. There were significant differences between 95% of the study group and none of the control group post-intervention. ($\chi^2 = 36.364$, $p < 0.001$).

DISCUSSION

This study aimed to evaluate the perceived stress levels among nursing students and investigate their relationship with stress, alongside the coping strategies employed to mitigate stress during clinical training. In a prior study, it was found that 47.92% of the students experienced moderate levels of perceived stress, while 25% reported experiencing high levels of stress. Moreover, a significant correlation was observed between perceived stress and anxiety in the current study, indicating that students with higher perceived stress scores also had higher anxiety scores.

According to the literature, nursing students are more likely to experience stress due to the diversity of academic programs global and the different scales used to measure stress [5,6]. The perception of stress varies across cultures and among individuals, affecting stress levels. The concepts of Lazarus and Folkman defined stress as a particular relationship between an individual and their environment that challenges or exceeds their resources and threatens their health [7]. Additionally, according to this definition of stress, in addition to individual and academic differences, it is also important to consider the impact of the environment on the levels of stress or anxiety the students presented, specifically, the variety of clinical placements they completed throughout their training. In terms of the year of study, our findings confirm previous studies in which students with the most experience displayed higher levels of stress than those with the least experience [8,9]. In order to properly interpret this finding, the student clinical placements should be taken into account, as previously mentioned. Clinical placements in more specialized services are generally completed in the later years of studies, while training in more general services requiring more basic competencies in the area of care and patient responsibility occurs in the first years of study. Thus, students with more extensive training, but who must also possess a greater level of competency and skills when caring for patients, are exposed to an increased level of anxiety and stress. These interpretations, however, should be exercised with caution, since, in this sense, the various training programs [10] In Folkman and Lazarus's view, problem solving is one of the best ways to deal with stress because it focuses on managing or altering behavior. Multiple studies with nursing students have found that

problem solving is the most effective coping strategy, despite using a different stress measurement scale than the one used in this study [11,13]. According to our findings regarding perceived stress and coping strategies, there is an inverse relationship between these three domains (problem solving, cognitive restructuring, and social support), suggesting people who suffer less stress are more likely to use these strategies. The correlation with the following domains also indicates that individuals experiencing greater stress are more likely to exhibit anxiety traits and state, and engage in strategies such as wishful thinking, self-criticism, and social withdrawal in order to avoid problems.

CONCLUSION

Study results show that mindfulness meditation can reduce perceived stress among students pursuing a B.Sc in Nursing and enhance coping strategies. Based on the significant improvements observed in the experimental group, mindfulness practices may be useful in easing the psychological burden associated with nursing education and clinical responsibilities. A mindfulness meditation practice could be a valuable tool for nursing students to manage stress and improve their mental health, given the high levels of stress they typically experience. In order to establish the validity of these findings and support broader adoption of mindfulness programs, future research should explore long-term effects and implementation across diverse educational settings.

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