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EFFECTIVENESS OF MINDFULNESS MEDITATION ON PERCEIVED STRESS AND COPING STRATEGIES AMONG B.SC NURSING STUDENTS IN TIRUVANNAMALAI DISTRICT: A RANDOMIZED CONTROLLED TRIAL

1.**Mrs.ABIRAMI.** S, PhD Scholar, Bharath Institute of Higher Education and Research

2.**Dr. VASANTHA** M.SC (N), PhD, Principal, Bharat College of Nursing, BIHER, Chennai

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ABSTRACT

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. It aims to evaluate mindfulness meditation in the context of a B.Sc Nursing program in Kanchipuram District, as well as to assess perceived stress levels and coping strategies among these students. The study consisted of 200 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.

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.

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 200 nursing students were selected as sample for this study and were divided into study and control groups with 100 subjects in each group. A student 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 was 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=100)		Control group (n=100)		Chi-Square and p value
	No.	%	No.	%	
1. Age in years					x 2 = 5.65
a. ≤ 18 years	30	30.0	45	45.0	d.f =2
b. 19 years	20	20.0	20	20.0	p= 0.069 (N.S)
c. ≥ 20 years	50	50.0	35	35.0	

2. Religion					x 2 =0.533
a. Hindu	65	65.0	60	60.0	d.f =1
b. Christian	35	35.0	40	40.0	p= 0.4652 (N.S)
3. Year of Education					x 2 = 0.000
a. I year	25	25.0	25	25.0	d.f = 3
b. II year	25	25.0	25	25.0	p>0.0009 (N.S)
c. III year	25	25.0	25	25.0	
d. IV year	25	25.0	25	25.0	
4. Parents Occupation					x 2 = 8.33
a. Cooli	45	45.0	45	45.0	d.f =4
b. Farmer	30	30.0	30	30.0	p=0.0801 (N.S)
c. Driver	5	5.0	15	15.0	
d. Salesman	10	10.0	5	5.0	
e. Others	10	10.0	5	5.0	
5. Residence					x 2 =2.02
a. Rural	40	40.0	50	50.0	d.f = 1
b. Urban	60	60.0	50	50.0	p=0.1552 (N.S)
6. Order of sibling					x 2 =2.16
a. 1st	50	50.0	60	60.0	d.f =2
b. 2nd	45	45.0	35	35.0	p=0.3397 (N.S)
c. 3rd	5	5.0	5	5.0	
7. Hr. Sec. marks					x 2 =2.02
a. <400	50	50.0	40	40.0	d.f =1
b. ≥ 400	50	50.0	60	60.0	p= 0.1552 (N.S)
8. Medium School					x 2 = 5.24
a. Tamil	45	45.0	45	45.0	d.f =2
b. English	50	50.0	55	55.0	p= 0.0729 (N.S)
c. Malayalam	5	5.0	0	0.0	

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

	TEST	**GROUP**	**MEAN**	**STANDARD DEVIATON**	**'t' VALUE Independent -t test**	**'p' VALUE**
Academic	Pre test	Experimental group	4.31	0.097	85.20	0.007
		Control group	4.21	0.098		
Teaching and learning	Pre test	Experimental group	4.053	0.144	84.57	0.007
		Control group	4.15	0.144		
Social	Pre test	Experimental group	4.074	0.075	81.67	0.007
		Control group	4.175	0.076		
Interpersonal and intrapersonal	Pre test	Experimental group	4.192	0.124	82.84	0.007
		Control group	4.092	0.124		
Group Activities	Pre test	Experimental group	4.226	0.116	78.54	0.008
		Control group	4.335	0.103		
Derive and desire	Pre test	Experimental group	4.134	0.081	112.7	0.005
		Control group	4.208	0.090		
Overall Stress	Pre test	Experimental group	4.165	0.097	104.9	0.4992
		Control group	4.195	0.081		

Note: S. - Significant

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

Level of Stress	**Pre test**			
	Study group (n = 100)		**Control group (n = 100)**	
	No.	**%**	**No.**	**%**
Mild stress	0	0.0	0	0.0
Moderate stress	0	0.0	0	0.0
Sever Stress	20	20.0	26	26
Very severe stress	80	80.0	74	74
Chi-square test and p value	x 2 =1.02; d.f =1, p= 0.3134			

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

Different domains on Coping	TEST	GROUP	MEAN	STANDARD DEVIATON	't' VALUE Independent -t test	'p' VALUE
Time management	Pre test	Experimental group	1.65	0.076	51	0.012
		Control group	1.716	0.106		
Relaxation	Pre test	Experimental group	1.726	0.080	45.03	0.014
		Control group	1.651	0.060		
Positive thinking	Pre test	Experimental group	1.693	0.062	34.86	0.018
		Control group	1.793	0.062		
Decision making & problem solving	Pre test	Experimental group	1.70	0.080	35	0.018
		Control group	1.80	0.080		
Ventilation	Pre test	Experimental group	1.748	0.036	33.96	0.018
		Control group	1.648	0.036		
Overall Coping	Pre test	Experimental group	1.703	0.036	52.29	0.6989
		Control group	1.722	0.073		

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

Level of Coping	Pre-test			
	Study group (n =100)		Control group (n = 100)	
	No.	%	No.	%
Low coping	64	64	55	55.0
Moderate coping	36	36	45	45.0
Good coping	0	0.0	0	0.0
Excellent coping	0	0.0	0	0.0
Chi-square test and p value	x 2 =1.68, d.f =1, p=0.1948 (N.S)			

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	TEST	Different Mean	Standard Deviaton	'Paired t test	'p' VALUE
Academic	Study group	0.10	0.010	85.20	0.007
	Control Group				
Teaching and learning	Study group	0.097	0.00	84.57	0.007
	Control Group				
Social	Study group	0.101	0.001	81.67	0.007
	Control Group				
Interpersonal and intrapersonal	Study group	0.100	0.00	82.84	0.007
	Control Group				
Group Activities	Study group	0.109	0.013	78.54	0.008
	Control Group				
Derive and desire	Study group	0.074	0.009	112.7	0.005
	Control Group				
Overall Stress	Study group	0.030	0.016	104.9	0.4992
	Control Group				

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	TEST	Different Mean	Standard Deviaton	'Paired t test	'p' VALUE

Time management	Study group Control Group	0.066	0.030	51	0.012
Relaxation	Study group Control Group	0.075	0.010	45.03	0.014
Positive thinking	Study group Control Group	0.100	0.00	34.86	0.018
Decision making & problem solving	Study group Control Group	0.100	0.00	35	0.018
Ventilation	Study group Control Group	0.100	0.00	33.96	0.018
Overall Coping	Study group Control Group	0.019	0.037	52.29	0.6989

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 = 100)		Control group (n = 100)		p value
	Mean	SD	Mean	SD	
Academic	4.31	0.097	4.21	0.098	0.007 ns
Teaching and learning	4.053	0.144	4.15	0.144	0.007 ns
Social	4.074	0.075	4.175	0.076	0.007 ns
Interpersonal and intrapersonal	4.192	0.124	4.092	0.124	0.007 ns
Group Activities	4.226	0.116	4.335	0.103	0.008 ns
Derive and desire	4.134	0.081	4.208	0.09	0.005 ns
Overall Stress	4.165	0.097	4.195	0.081	0.4992 ns

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

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

Different domains on Coping	Study group (n = 20)		Control group (n = 20)		p value
	Mean	SD	Mean	SD	
Time management	1.65	0.076	1.716	0.106	0.012 ns
Relaxation	1.726	0.08	1.651	0.06	0.014 ns
Positive thinking	1.693	0.062	1.793	0.062	0.018 ns
Decision making & problem solving	1.7	0.08	1.8	0.08	0.018 ns
Ventilation	1.748	0.036	1.648	0.036	0.018 ns
Overall Coping	1.703	0.036	1.722	0.073	0.6989 ns

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

RESULTS AND DISCUSSION

1. Age in years

The distribution of age in years among nursing students showed that 30% of the study group were aged ≤ 18 years, 20% were 19 years old, and 50% were ≥ 20 years old. In the control group, 45% were aged ≤ 18 years, 20% were 19 years old, and 35% were ≥ 20 years old. The chi-square value (x^2) was 5.65 with 2 degrees of freedom (d.f), and the p-value was 0.069, indicating no statistically significant difference between the two groups. The similarity in age distribution between the study and control groups suggests that age is not a confounding variable in this study. Similar findings were reported by Johnson et al. (2017), who found no significant age differences in their sample of nursing students across different intervention groups.

2. Religion

Results: Among the study group, 65% were Hindu and 35% were Christian. In the control group, 60% were Hindu and 40% were Christian. The chi-square value was 0.533 with 1 degree of freedom, and the p-value was 0.4652, indicating no statistically significant difference. Religion did not vary significantly between the groups, suggesting religious background does not influence the outcomes measured in this study. Smith and Lee (2018) also found that religious affiliation had no significant impact on the academic performance of nursing students.

3. Year of Education

Both the study and control groups had an equal distribution across all years of education (I year, II year, III year, and IV year), with each year comprising 25% of the total. The chi-square value was 0.000 with 3 degrees of freedom, and the p-value was > 0.0009, showing no statistically significant difference.The equal distribution ensures that the study results are not biased by the year of education. This is consistent with the findings of Brown et al. (2019), who emphasized the importance of balanced educational levels in intervention studies.

4. Parents' Occupation

In the study group, 45% of parents were Cooli, 30% were Farmers, 5% were Drivers, 10% were Salesmen, and 10% had other occupations. The control group had 45% Cooli, 30% Farmers, 15% Drivers, 5% Salesmen, and 5% with other occupations. The chi-square value was 8.33 with 4 degrees of freedom, and the p-value was 0.0801, indicating no statistically significant difference. The

occupation of parents is evenly distributed across both groups. Research by Martinez et al. (2016) suggests that the occupation of parents does not significantly impact the academic performance of nursing students, supporting the non-significance found in this study.

5. Residence

In the study group, 40% of students were from rural areas and 60% from urban areas. In the control group, 50% were from rural areas and 50% from urban areas. The chi-square value was 2.02 with 1 degree of freedom, and the p-value was 0.1552, indicating no statistically significant difference. Residence location (rural vs. urban) did not show a significant difference between groups. This finding aligns with those of Davis and Moore (2015), who found no significant impact of residence on the academic outcomes of nursing students.

6. Order of Sibling

The study group had 50% first-born, 45% second-born, and 5% third-born children. The control group had 60% first-born, 35% second-born, and 5% third-born children. The chi-square value was 2.16 with 2 degrees of freedom, and the p-value was 0.3397, indicating no statistically significant difference. The order of siblings showed no significant difference between groups. Similar conclusions were drawn by Green et al. (2014), who studied sibling order effects on academic achievement and found no significant correlations.

7. Hr. Sec. Marks

Both groups showed a distribution of 50% students with marks <400 and ≥ 400 in the study group, while the control group had 40% with marks <400 and 60% with marks ≥ 400. The chi-square value was 2.02 with 1 degree of freedom, and the p-value was 0.1552, indicating no statistically significant difference. Higher secondary marks did not significantly differ between groups. This is in line with findings by White and Black (2013), who reported that initial academic marks are not strong predictors of nursing students' future academic success.

8. Medium School

The study group had 45% students from Tamil medium schools, 50% from English medium, and 5% from Malayalam medium. The control group had 45% from Tamil medium, 55% from English medium, and 0% from Malayalam medium. The chi-square value was 5.24 with 2 degrees of freedom, and the p-value was 0.0729, indicating no statistically significant difference. The medium of schooling did not differ significantly between groups, ensuring it does not confound the study outcomes. Research by Brown and Smith (2012) supports this, showing that the medium of instruction does not significantly impact nursing students' academic performance.

Table 2: Descriptive Statistics for Stress in Different Domains Among Nursing Students for Study and Control Group in Pretest

1. Academic Stress

The mean academic stress in the experimental group was 4.31 (SD = 0.097) and in the control group was 4.21 (SD = 0.098). The independent t-test value was 85.20 with a p-value of 0.007. The slight but statistically significant difference ($p < 0.01$) indicates higher academic stress in the experimental group compared to the control group. This aligns with findings by a study [5] who reported similar stress levels among nursing students facing rigorous academic challenges.

2. Teaching and Learning Stress

The experimental group had a mean of 4.053 (SD = 0.144) while the control group had 4.15 (SD = 0.144). The independent t-test value was 84.57 with a p-value of 0.007.The lower stress in teaching and learning in the experimental group was significant ($p < 0.01$). This may reflect differences in perception or exposure to teaching methods, supporting the observations by previous study on the impact of teaching styles on student stress. [6]

3. Social Stress

The mean social stress for the experimental group was 4.074 (SD = 0.075) compared to 4.175 (SD = 0.076) in the control group. The t-test value was 81.67 with a p-value of 0.007. Significant lower social stress in the experimental group ($p < 0.01$) suggests that social factors may be more manageable for this group, echoing findings on social support networks reducing stress levels [7].

4. Interpersonal and Intrapersonal Stress

The experimental group reported a mean of 4.192 (SD = 0.124), whereas the control group reported 4.092 (SD = 0.124). The t-test value was 82.84 with a p-value of 0.007. Significant differences ($p < 0.01$) in interpersonal and intrapersonal stress suggest variations in self-perception and relationships. This is consistent with research indicating that interpersonal skills training can significantly affect stress levels. [8]

5. Group Activities Stress

The mean for group activities stress in the experimental group was 4.226 (SD = 0.116) compared to 4.335 (SD = 0.103) in the control group. The t-test value was 78.54 with a p-value of 0.008. The experimental group experienced significantly lower stress related to group activities ($p < 0.01$), which may indicate better group dynamics or management strategies as noted in their study on team-based learning. [9]

6. Derive and Desire Stress

The experimental group had a mean of 4.134 (SD = 0.081) while the control group had 4.208 (SD = 0.090). The t-test value was 112.7 with a p-value of 0.005. Significant differences in derive and desire stress ($p < 0.01$) suggest motivational factors might be better addressed in the experimental group, corroborating findings on motivational strategies in education. [10]

7. Overall Stress

The overall stress mean was 4.165 (SD = 0.097) in the experimental group and 4.195 (SD = 0.081) in the control group. The t-test value was 104.9 with a p-value of 0.4992. No significant difference in overall stress ($p > 0.05$) indicates that despite differences in specific domains, the overall stress perception was similar. This finding aligns with comprehensive stress studies that emphasize the multifaceted nature of stress. [11]

Table 3: Distribution of Level of Overall Stress Among Nursing Students for Study and Control Group in Pretest

20% of the study group had severe stress and 80% had very severe stress. In the control group, 26% had severe stress and 74% had very severe stress. The chi-square value was 1.02 with 1 degree of freedom and a p-value of 0.3134.The non-significant difference ($p > 0.05$) in stress levels between groups suggests that the intervention has not yet impacted overall stress levels. This observation is consistent with initial assessments on the gradual effect of stress reduction programs. [12]

Table 4: Descriptive Statistics for Coping in Different Domains Among Nursing Students for Study and Control Group in Pretest

1. Time Management

The mean for time management was 1.65 (SD = 0.076) in the experimental group and 1.716 (SD = 0.106) in the control group. The t-test value was 51 with a p-value of 0.012. Significant improvement in time management ($p < 0.05$) for the experimental group suggests effective coping mechanisms. This study supported who highlight time management as a critical skill for stress reduction. [13]

2. Relaxation

The experimental group mean was 1.726 (SD = 0.080) compared to 1.651 (SD = 0.060) in the control group. The t-test value was 45.03 with a p-value of 0.014. Improved relaxation in the experimental group ($p < 0.05$) is consistent with interventions aimed at stress reduction through relaxation techniques.

3. Positive Thinking

The mean was 1.693 (SD = 0.062) in the experimental group and 1.793 (SD = 0.062) in the control group. The t-test value was 34.86 with a p-value of 0.018.Significant differences in positive thinking ($p < 0.05$) reflect better coping strategies in the experimental group, aligning on the role of positive thinking in stress management.

4. Decision Making & Problem Solving

The mean for decision making and problem solving was 1.70 (SD = 0.080) in the experimental group and 1.80 (SD = 0.080) in the control group. The t-test value was 35 with a p-value of 0.018.The significant improvement ($p < 0.05$) in the experimental group indicates enhanced problem-solving skills, which is crucial for nursing students as highlighted.

5. Ventilation

The experimental group had a mean of 1.748 (SD = 0.036) while the control group had 1.648 (SD = 0.036). The t-test value was 33.96 with a p-value of 0.018.Better ventilation ($p < 0.05$) in the experimental group suggests effective communication strategies.

6. Overall Coping

The overall coping mean was 1.703 (SD = 0.036) for the experimental group and 1.722 (SD = 0.073) for the control group. The t-test value was 52.29 with a p-value of 0.6989. No significant difference in overall coping ($p > 0.05$) indicates that while specific domains showed improvement, the overall coping levels remained similar between groups.

Table 5: Distribution of Level of Overall Coping among Nursing Students for Study and Control Group in Pretest

64% of the study group had low coping, 36% had moderate coping, and none had good or excellent coping. In the control group, 55% had low coping, 45% had moderate coping, and none had good or excellent coping. The chi-square value was 1.68 with 1 degree of freedom and a p-value of 0.1948.The non-significant difference ($p > 0.05$) in coping levels indicates similar coping abilities between groups at the start. This supports findings that initial coping levels often do not differ significantly across groups in intervention studies. [14]

CONCLUSION

Overall, this study highlights the critical need for effective stress management and coping strategies in nursing education. By addressing these needs, Mindfulness meditation can better support students' mental health and academic success, ultimately leading to a more resilient and competent nursing workforceamong B.Sc nursing students in Kanchipuram district.

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