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Evaluate the Effectiveness of Pranayama on Educational Stress among Adolescents in Selected School at Kanyakumari District

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Abstract
Aim: The objective of the current study was to assess the effectiveness of pranayama on educational stress among adolescents. **Methods:** In a quasi-experimental one-group pretest and posttest design, adolescents between the ages of 12 and 18 were selected using a purposive sampling technique. The self-structured demographic variables and the Educational Stress Scale for Adolescents (ESSA) (Sun J, 2011) were used to assess the pre and post-test levels of educational stress. A structured interview schedule was used to assess the adolescents' level of educational stress. Following the pre-test, samples were given daily pranayama training in a calm and quiet environment. The Pranayama procedure took about 30 minutes to complete. A post-test was performed three months after the intervention. **Results:** Among the 95 adolescents who participated in the study, the pre-test stress levels were mild (15.8%), moderate (45.3%), and severe (38.9%). The same was reduced in the posttest, with mild being 77.8% and moderate being 22.1%. The severe stress was null. There was a significant difference in educational stress levels before and after Pranayama training ($t=27.707$; $p<.0001$). The adolescents' mean score of educational stress before and after Pranayama was 56.7 and 31.4, respectively. The mean reduction was 25.4±8.9. There was a significant association between age, gender, grades, and internet usage; 6.0, 7.3, 11.8 and 13.866, respectively, at $P>0.05$. The results discovered that pre-educational stress was decreased after Pranayama training. **Conclusion:** Educational stress is inevitable for school-age adolescents in today's highly competitive world. In accordance with the study findings, Pranayama practice reduces stress, as evidenced by a significant reduction in educational stress.
Keywords: Educational Stress, Stress, Adolescents, Pranayama
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1. Introduction

Stress is an unavoidable part of life. Life is full of annoyances, deadlines, frustrations, and expectations. For some people, stress is so common that it has become a way of life. Stress can be both harmful and beneficial. Stress can often help people stay focused and energetic. Memory problems, moodiness, aches, and pains, and eating more or less are all symptoms of stress. Stress can be defined as any type of change that causes physical, emotional, or psychological strain. Stress is your body's response to anything that requires attention or action (Scott, 2022).

Over one-fourth of the world's population—1.8 billion adolescents aged 10 to 24—live in developing nations, making up 89% of this group. By 2032, their population is anticipated to reach around 2 billion (Mascarenhas, 2016). Adolescence is a period of significant psychosocial and physiological development. One example is how a person responds to stressors. Adolescence is distinguished by significant changes in hypothalamic-pituitary-adrenal (HPA) axis reactivity, which results in increased stress-induced hormonal responses (Romeo, 2013). Adolescents frequently report that schoolwork, particularly exams and expectations from parents and family to perform well in school, is stressful. Lack of time-having too much to do, feeling unprepared or overloaded, lack of sleep, their social relationships with friends and boyfriends or girlfriends, and the extracurricular commitments life challenges, such as leaving school or getting into tertiary studies or employment. Assessing the need for interventions among adolescents through a deeper understanding of their perception of stress and stressors, as well as their innate coping mechanisms, is one of the most important factors to consider when developing interventions. After 2000, a number of studies showed that stress was prevalent among Indian adolescents, with rates ranging from 13% to 45% (Rentala S, 2019). Another study conducted in Delhi discovered that overall, 87.7% of adolescents experience stress (Bhaskar, 2015).

Academic stress is defined as an experience in which a student is burdened by the demands of time and energy to achieve specific academic goals. According to (Mascarenhas, 2016), 28.65 lakh children in India (between the ages of 10 and 24) have lost health as a result of depressive disorders. Academic stress is characterized by emotional distress related to impending difficulties, failure, or even the fear of potential academic failure. Academic stressors manifest themselves in a variety of ways in a student's environment, including at school, home, in relationships with their peers, and even in their neighborhood. Overwhelming academic pressure can have a negative impact on students' academic performance by increasing the prevalence

of psychological and physical issues like depression, anxiety, nervousness, and stress-related disorders (Thakkar, 2018).

The Indian educational system is textbook based, emphasizes memorization of lessons by rote, and necessitates long periods of daily systematic study. High school students are expected to follow complex study schedules that last from early morning until late in the evening, leaving little time for socializing and leisure activities. Two main categories of educational boards recognized by the Indian government oversee the country's educational system for schools. The All-India Boards, such as the Central Board of Secondary Education (CBSE), the Council for the Indian School Certificate Examinations (CICSE), and the National Open School, are included in the first category. Because there aren't enough high-quality institutions to accommodate the growing number of children (Sibnath Deb, 2015).

Moreover, the majority of senior high school science majors experience additional stress because they frequently take entrance exams for programs like engineering, medicine, and other specialized professional programs. Many students experience extreme anxiety as a result of the stress of exam preparation. Children therefore compete against one another at the beginning of pre-primary education and then at the conclusion of each year in the form of exams that determine their advancement to the next grade. In classrooms teachers attempt to cover all aspects of a vast syllabus, often disregarding the comprehension level of students (Sibnath Deb, 2015). These structural factors aggravate high school students' academic stress.

Human beings breathe about 15 times per minute and 21,600 times per day. Respiration fuels the burning of oxygen and glucose, producing energy to power every muscular contraction, glandular secretion, and mental process. The breath is intimately linked to all aspects of human experience. Most people breathe incorrectly, using only a small part of their lung capacity. The breathing is then generally shallow, depriving the body of oxygen and prana essential to its good health. Rhythmic, deep, and slow respiration stimulates and is stimulated by calm, content states of mind. Irregular breathing disrupts the rhythms of the brain and leads to physical, emotional, and mental blocks. These, in turn, lead to inner conflict, imbalanced personality, disordered lifestyle and disease. Pranayama establishes regular breathing patterns, breaking this negative cycle and reversing the process. It does so by taking control of the breath and re-establishing the natural, relaxed rhythms of the body and mind. As a result, in the beginning of the pranayama practices, more emphasis is placed on inhalation and exhalation in order to strengthen the lungs and balance the nervous and pranic systems in order to prepare for the practice of kumbhaka. By cleansing, regulating, and activating the nadis, these practices affect the flow of prana there, resulting in stability for both the body and the mind (Saraswati, 2002).

In order to keep their minds free of academic stress and to help them achieve a higher level, the researcher has decided to teach pranayama to adolescents. Therefore, the purpose of the current research is to evaluate the effectiveness of Pranayama on educational stress among Adolescents.

2. Materials and Methods

2.1 Setting

The population of the study included the adolescents, studying in selected school at Kanyakumari District, Tamilnadu. Over 600 students in different grades were enrolled in the school.

2.2 Study Participants

Adolescents between the ages of 12 and 18 who were enrolled in the 9th and 12th grades were included in the study population. A purposive sampling technique was used to choose the students. In total, 150 students were approached for the study. However, 45 of them declined to participate. 95 of the 105 students who participated in the study's data were used in the final analysis, while 10 students were removed from the study due to incomplete questionnaires.

2.3 Criteria for sample selection

Adolescents between the ages of 12 and 18, available during the study period, both boys and girls, and cooperative were included in the study. Adolescents who were older than 17 and younger than 13 years old, had a breathing problem, and used any type of relaxation technique were excluded.

2.4 Study tool

These include structured demographic variables and the Educational Stress Scale for Adolescents (ESSA). Before administering questionnaires to study participants, they were pretested in a similar setting for suitability and accuracy by experts.

2.5 Description of the tool

The demographic variables consist of 10 items such as age, sex, grade (school year), relationship of father and mother, father’s education, mother’ education, father’s occupation and mother’s occupation and family income

level.

Educational Stress Scale for Adolescent (ESSA) developed by (Sun J, 2011) is comprised of 16 questions (n=16) using 5-point scale from 1 (strongly disagree) to 5 (strongly agree) with higher scores indicating greater stress. The minimum and maximum scores were 0 and 80 respectively. 1 - Strongly disagree, 2 – Disagree, 3 – Neutral, 4 – Agree and 5 - Strongly agree. Likert scale with answers to strongly disagree to strongly agree and classified into severe (score >58), moderate (score 51-58), and mild (score <50) (Nadia Ramadhani, 2021).

2.6 Ethical considerations

The Research Ethical Committee approved the study. The ethical considerations were addressed by explaining the ethical rights to the participants and their parents both orally and in writing. Following an explanation of the study's purpose, risks, and benefits, the participants and their parents provided written consent.

2.7 Data Collection Procedure

The study was conducted at C.S.I. Public Matric Higher Secondary School in Kanyakumari district. Permission was obtained from the school principal. A survey was first conducted, after which samples were chosen using the purposive sampling technique based on sampling criteria. The researcher obtained verbal consent and ensured confidentiality. Samples were introduced the researcher and the study.

A structured interview schedule was used to assess the samples' level of educational stress. The samples were instructed to choose the correct response from a menu of options. After the pre-test, samples received daily training in pranayama in a calm and quiet environment. It did take about 30 minutes to complete the Pranayama procedure.

The samples were required to perform pranayama in front of the researcher every day, either before the start of class or at the end of the school day. Students were under the direct supervision of a physical education teacher while the researcher was away. Three months after the intervention, a post test was conducted.

3. Results

This research examined the effectiveness of Pranayama on Educational Stress among Adolescents. A statistical package, IBMSPSS statistics-20, was used to code and analyze the data. Student paired "t" tests were used to interpret the study participants' stress levels. The association between demographic variables and their pretest stress was under taken by $\chi 2$ (Chi-square test). The P-values less than or equal to 0.05 ($P \leq 0.05$) were treated as statistically significant.

Table 1: Description of demographic variables among adolescent (n=95)

Demographic Variables	Components	Frequency %
Age group	12-14	10 (10.5)
	15-18	85 (89.5)
Gender	Males	36 (37.9)
	Females	59 (62.1)
Grade	9	4 (4.2)
	10	50 (52.6)
	11	21 (22.1)
	12	20 (21.1)
Father’s Type	Biological	86 (90.5)
	Step father	0(0.0)
	Adoptive	0 (0.0)
	No father	9 (9.5)
Mother’s type	Biological	93 (97.9)
	Step Mother	0 (0.0)
	Adoptive	0 (0.0)
	No Mother	2 (2.1)
Fathers’ Occupation	Govt. service	2 (2.1)
	Professional	10 (10.5)
	Self -Employ	34 (35.8)
	Farmer	40 (42.1)
	Un-Employed	9 (9.5)
Mothers’ Occupation	Govt. service	6 (6.3)
	Professional	16 (16.8)
	Self -Employ	6 (6.3)

Demographic Variables	Components	Frequency %
	Farmer	2 (2.1)
	Un-Employed	65 (68.4)
Fathers' Education	Degree +	23 (24.2)
	High school	33 (34.7)
	Primary	29 (30.5)
	Never school	1 (1.1)
	Do not Know	9 (9.50
Mothers' Education	Degree +	38 (40.0)
	High school	32 (33.7)
	Primary	23 (24.2)
	Never school	1 (1.1)
	Do not Know	1 (1.1)
Family monthly income	<5000	43 (45.30
	<10000	27 (28.4)
	10000-25000	19 (20.0)
	25000-50000	6 (6.3)
	500000+	0 (0.0)
Overall health status	Very bad	1 (1.1)
	Bad	1 (1.1)
	Moderate	22 (23.2)
	Good	54 (56.8)
	Very good	17 (17.9)
Internet usage of last 1 month	Never	8 (8.4)
	Sometimes	65 (68.4)
	Often	22 (23.2)
Computer/Video games Play	Never	65 (68.4)
	Sometimes	25 (26.3)
	Often	5 (5.30

Table 1 describes the study subjects, according to their demographic variables. In respect of the age group 15–18 years, it was 89.5% as maximum. Among the genders, the males and females were 37.9% and 62.1%. Nearly 52.6% of the students were in 10th grade. 90.5% of the students have biological fathers, and 97.9% have biological mothers. In respect of fathers' occupation, 42.8% and 35.6% were self-employed and farmers, respectively. Regarding mothers' occupation, 68.4% were unemployed. Regarding the educational status of fathers and mothers, it was 24.2% and 40% were graduates or above. The family monthly income <5000 was 45.3% of the maximum. 56.8% of the subjects had good health status. The internet usage was some time ago at 68.4%. Two thirds of the students (68.4%) had never played computer/video games.

Table-2: Assessment of pre and posttest level of educational stress:

Stress Level	Scores	Pre test	Post test
		No (%)	No (%)
Mild	≤50	15 (15.8)	74 (77.8)
Moderate	51-58	43 (45.3)	21 (22.1)
Severe	>58	37 (38.9)	0 (0.0)

The assessment of educational stress level at pre and posttest levels is shown in table 2. Pre-test stress levels were mild (15.8%), moderate (45.3%), and severe (38.9%). The same was reduced in posttest, with mild being 77.8% and moderate being 22.1%. The severe was nil.

Table-3: Effectiveness of Pranayama on reduction of educational stress at pre and posttest:

Variable	Pre test		Post test		Reduction		"t"	df	Significance
	Mean	SD	Mean	SD	Mean	SD			
Stress	56.7	7.5	31.4	4.6	25.4	8.9	27.707	94	P<0.001

Table 3 compares stress levels before and after the test. At pretest mean stress was 56.7±7.5 and posttest was 31.4±4.6. The mean reduction was 25.4±8.9. The reduction was statistically very highly significant (P<0.001).

Table 4: Association between pre-educational stresses with demographic variables:

Demographic variables	Educational stress, frequency (%)		Significance
	Mild + Moderate	Severe	
Age group 12-14 15-18	0 (0.0) 39 (41.1)	10 (10.5) 46 (48.4)	6.0
Gender Male Female	12 (12.6) 27 (28.4)	24 (25.2) 32 (33.6)	7.3
Grades 9 & 10 11 12	14 (14.7) 13 (13.7) 12 (12.6)	40 (42.2) 8 (8.4) 8 (8.4)	11.8
Type of fathers Biological No Father	36 (37.9) 3 (3.2)	50 (52.6) 6 (6.3)	0.2
Type of mothers Biological Others	39 (41.1) 0 (0.0)	54 (56.8) 2 (2.1)	1.4
Fathers' occupation Govt. + Profess+SE Farmer & UE	19 (20.0) 20 (21.1)	27 (28.4) 29 (30.5)	0.002
Mothers occupation Govt + Profess+ SE Farmer & UE	14 (14.7) 25 (46.3)	16 (16.8) 40 (42.1)	0.571
Fathers' education Degree + High school Primary +No	8 (8.4) 13 (13.7) 18 (18.9)	15 (15.8) 20 (21.1) 21 (22.0)	0.831
Mothers' education Degree + High school Primary +Other	17 (17.9) 12 (12.6) 10 (10.5)	21 (22.1) 20 (21.1) 15 (15.7)	0.898
Monthly income <5000 <10000 10000-50000	19 (20.0) 10 (10.5) 10 (10.5)	24 (25.3) 17 (17.9) 15 (15.8)	0.366
Health status Moderate + Good Very good	10 (6.9) 22 (16.7) 7 (5.4)	14 (14.7) 32 (33.7) 10 (10.5)	0.006
Internet usages Never + Some Often	38 (40.0) 1 (1.1)	35 (36.8) 21 (22.1)	13.866
Computer/Video play Never Some times+ Often	31 (32.6) 8 (8.4)	34 (35.8) 22 (23.2)	3.750

Table 4 shows the findings from the study of the relationship between educational stress and demographic variables. Data findings revealed that a significant association between age, gender, grades, and internet usage; 6.0, 7.3, 11.8 and 13.866 respectively.

4. Discussion

In the current study, an attempt has been made to evaluate the effect of pranayama on adolescent educational stress. The study findings showed that, the mean post-test level significantly decreased the level of stress among adolescents. At pretest mean stress was 56.7±7.5 and posttest was 31.4±4.6. The mean reduction was 25.4±8.9. The reduction was statistically very highly significant (P<0.001). This result was consistent with the findings by (K.V, 2020), 90% of the samples had moderate stress in the pre-test. The mean post-test stress

score (61.07+/-16.57) in the experimental group was lower than the mean pre-test stress score (78.31+/-17.93). There was a significant difference in stress scores before and after pranayama in the experimental group (t29=17.24, p0.05), as well as a comparison of stress scores in the experimental group with the control group. This suggests that pranayama was effective in reducing stress.

The present study discovered that the age group of 15 to 18 years reported severe stress (89.5%). Furthermore, females (61.8%) experience more stress than males (38.2%). This result supported the findings of (Graves BS, 2021) showed that the majority of female students reported higher stress levels than their male counterparts. In the group of female subjects, moderate stress levels were reported by 77.3% and severe stress levels by 21.6%. In contrast, only 7.1% of male participants reported severe stress, while 90.9% of them reported moderate stress.

According to this study, students in grades 9 and 10 experience more stress (56.8%) than those in grades 11 and 12 (22.1% and 21.1%, respectively). Similar findings were observed in a study by (Bhattarai, 2017) revealed that the average age of respondents was 15.26 0.96, and 48 percent of respondents had a high level of stress. There was a statistically significant relationship between respondents' stress levels and sex (P= 0.025), type of residence (P=0.049), and father's education level (P= 0.045).

Findings of the present study revealed that in the association between internet usage and pre-educational stress, the results revealed a statistically significant association between internet usage and stress (P<0.001). The calculated chi-square value was 13.866. This result was similar with the findings of (Unsar, 2020) explored the correlation between Internet use and stress levels in university students. According to the study, the average amount of time students spent on the Internet per week was 23.1±20.1 hours indicate a significant positive correlation (p.005) between the students' OCS and SS scores and their daily and weekly Internet usage.

Conclusion

Stress exhausts our mental and physical resources, impairs our ability to use our skills effectively, and thus has an impact on our overall well-being and negatively impacts performance. This study findings conclude that with the intervention of pranayama, educational stress can be reduced. Pranayama is a convenient and low-cost health practice. It is so simple for students to adopt that it can be incorporated into their daily activities as in everyday life. As a result, it is suggested that pranayama become a regular practice in schools.

Limitations

In this study, self-administered questionnaires were used. Therefore, it is impossible to eradicate reporting bias. The sample size was rather small given Kanyakumari's substantial higher secondary student population. As a result, caution is required when generalizing the study's findings.

Recommendation

The following recommendations are based on the findings of the current study: A similar study can be replicated on a large sample. The effectiveness of pranayama in adolescents coping with academic stress can be studied.

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Conflict of Interest

The authors declare that there is no conflict of interest. The research was self-funded by the authors.

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