Research Article

The Efficacy Of Combined Transactional Analysis And Biofeedback Strategies On Enhancing Academic Motivation In Adolescents

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Abstract

This study investigated the effectiveness of a combined therapeutic package integrating Transactional Analysis (TA) principles with Biofeedback Strategies (BFS) to enhance academic motivation (AM) in school-aged adolescents. Academic motivation is conceptualised through Self-Determination Theory as comprising three factors: Intrinsic, Extrinsic, and Amotivation. TA was selected as a therapeutic tool to enhance awareness of the Adult (A) Ego State, which facilitates decision-making, and to improve time structuring (using the Egogram and Structurogram), addressing the subjective component. Electromyogram (EMG) Biofeedback was utilised for relaxation training and self-monitoring of the physiological component. A sample of 32 teenage students (ages 13-15) with low-to-medium AM scores underwent a six-month, multi-session intervention program, with a matched control group (N=32) assessed for comparison. Pre- and post-intervention evaluations utilised the Academic Motivation Scale (AMS), Egogram, Structurogram, and quantified EMG responses. Results demonstrated a highly significant increase in overall AM in the experimental group (pre-mean 68.78 vs. post-mean 74.41, $p < .01$). A significant difference was observed in scores related to Intrinsic and Extrinsic Motivation ($p < .05$). EMG-monitored muscular relaxation showed improvement (pre-mean 55.84% vs. post-mean 63.28%, $p < .01$). The findings supported the rationale that integrating TA's focus on self-decision and here-and-now awareness with Biofeedback for self-monitoring of muscular relaxation enhances self-responsibility and academic motivation in adolescents.

Introduction

Motivation is an internal process that activates, guides, and influences behaviour. Basic biological needs like hunger, shelter, and sex serve as motivating factors. Different forms of motivation exist, including aggressive motivation and achievement motivation. Academic motivation (AM) refers to the desire, willingness, and activity directed toward academic pursuits. Deci (1975) detailed various aspects of AM, and later, in-depth studies by Deci & Ryan (1985, 1991) proved useful for understanding the factors and concepts of AM. Together, Deci, Vallerand, Pelletier, and Ryan developed the concept of AM, which includes three levels of application: Intrinsic Motivation (IM), Extrinsic Motivation (EM), and Amotivation (AM). IM involves the pleasure and satisfaction gained from the activity, while EM is primarily driven by achievement or gains, and AM reflects indifference and a lack of interest or goal. The psychological need for autonomy forms the basis of human motivation, leading Deci and Ryan (1991) to introduce the Self-Determination Theory. Autonomy includes individuals' freedom to initiate, maintain, and regulate their behaviour. Motivation also possesses an emotional dimension, with self-decision being another influential factor, particularly for academic motivation. Transactional Analysis (TA), developed by Eric Berne (1910–1970), is a comprehensive theory of human growth, development, and behaviour that addresses both the emotional and decisional aspects of motivation. As part of a coherent psychotherapy system, TA tools can be applied as a counselling method to a wide range of human dysfunctions. TA helps individuals reach awareness, spontaneity, and intimacy by utilising the contractual method and open communication as guiding principles. The theory posits that a person decides their responses to environmental pressure, and the decision for change is their option. Berne (1961) forwarded the theory that the structure of personality comprises Extero-Psyche, Neo-Psyche, and Archeo-Psyche, which are psychological realities representing the parental figure, objective appraisal, and childhood feelings, respectively, and are called ego states. An ego state is defined as a consistent pattern of feeling and experience directly related to a corresponding consistent pattern of behaviour. The three ego states are: Parent Ego State (P), based on uncritically copied items from parent figures in the past, relating to opinions, beliefs, and customs; Child Ego State (C), which involves replaying behaviors, thoughts, and feelings from one's past, relating to feelings, needs,

and moods; and Adult Ego State (A), which is a direct response to the present or "here and now", relating to information, options, and procedure. The Parent and Child ego states have their roots in the past. Berne (1961) stated that anything learned can be unlearned, and anything decided can be changed. For change to be meaningful and effective, it must also occur on an emotional level (Dusay, 1991), leading a person to gain spontaneity, intimacy, and awareness, which in turn makes motivation more effective and long-lasting. Other TA concepts leading to increased motivation include Strokes, Life positions, Communications (Transactions), and Rackets. A Stroke is also called recognition and is needed for an individual to thrive. Strokes can be positive or negative, and a liberal attitude toward giving, accepting, asking for, and self-stroking is important. Four life positions are mentioned in TA: "I am Ok; you are Ok," "I am Ok; you are not Ok," "I am not Ok; you are Ok," and "I am not Ok; you are not Ok", with the ideal "I am Ok; you are Ok" position encouraging the child to take responsibility. The child often grows amidst doubts or injunctions, such as "Don't think," "Don't feel," and "Don't be", from which the child needs to gain autonomy. Berne mentioned three types of transactions: Parallel, Crossed, and Ulterior, noting that Crossed and Ulterior transactions are unhealthy, and the "I am Ok; You are OK" life position leads to a parallel transaction. The use of TA in the classroom has been shown to improve behaviour, resulting in a more conducive learning environment, thereby raising self-esteem and academic standards. Clarity in a situation, leading to change and autonomy, is gained by sorting out the present from the past. TA deals with motivation by considering the significance of internal processes like decision-making and the human hunger for recognition, or Stroke. Motivation in academic pursuits is enhanced when a person gets clarity and better awareness, with the stage of awareness reached through cathecting the Adult Ego State. Improved stroking patterns, time structuring, and Adult awareness led the person to higher levels of motivation. Simple TA tools like Strokes, Structural Analysis, Egogram, and Redecision work enhance motivation in the academic area for teenagers, based on self-decision and awareness. Redecision and change invariably invite stress, which can be managed by self-monitoring, where Biofeedback Strategy (BFS) becomes relevant. Biofeedback is a therapeutic method of forming information loops that allows the client, the therapist, or both to observe and modify internal psychophysiological events while they are in process. Feedback is the returning part of a system that guides the control of body processes once considered involuntary. BFS provides subjective profiles using operant conditioning principles to give immediate feedback on the functioning of the body, operating on the idea that the autonomic nervous system can come under voluntary control. Neurofeedback protocols have been used for treating attention deficit disorders. BFS involves the recording and display (visual or auditory) of small physiological changes in parameters like Galvanic Skin Response (GSR) and Electromyography (EMG), which satisfies teenage curiosity in assessing self-relaxation skills. The medical potential of biofeedback shows that the normally involuntary autonomic nervous system can be operantly conditioned. The most effective instruments measure electrical potentials of muscle fibres (EMG), alpha waves in relaxed states (EEG), decreased skin conductivity during relaxation (GSR), and skin temperature (thermistor). Subjects learn to regulate these biological states and can monitor and self-regulate certain bodily functions through this specialised equipment. BFS can be independently used or combined with relaxation. Models explaining biofeedback's effects include the operant model, the motor skills model, the cybernetics/systems theory model (maintaining homeostasis), and the antistress/relaxation model. Managing discomfort at the feedback level can be done by amplifying the Adult Ego State. Academic motivation is blocked when the person is unable to visualise success; TA gives clarity of vision, and BFS ensures relaxation. Therefore, TA and BFS may jointly facilitate academic motivation, and the combined package becomes instrumental in motivating and improving academic performance.

An attempt is made to study the impact of using TA and biofeedback strategies on academic motivation. TA is used for increasing self-awareness, sorting out options, making decisions, and assessing time utilisation, while BFS is meant for self-monitoring desired change through effective relaxation. Blocks to motivation are often caused by fear of failure, pre-judgment, and lack of confidence. If P and C deliberations are properly managed, they can lead a person to Adult (A) awareness based on "here and now" solutions. Clarity of goal and skills are gained in the Adult ego state, and self-decisions made in A are implemented. Time structuring and increased motivation result from Adult awareness. Difficulty in relaxation can be tackled by self-monitoring through BFS, which is more effective when relaxation markers are quantified. GSR, EEG, and EMG feedback encourage self-relaxation. Thus, TA helps to reach a

decision, BFS facilitates self-monitoring and relaxation, and a combined model increases efficacy because internal dynamics can be channelled by TA for a meaningful self-decision, while the person can relax through BFS. Self-management and self-monitoring through feedback increase the benefit, and knowing oneself promotes confidence.

Methodology

The present study employed a single-group outcome design with multiple assessments to evaluate the effectiveness of a combined model of Transactional Analysis (TA) and Biofeedback Strategies (BFS) in enhancing academic motivation among school students. Assessments were conducted at three stages: before the intervention (pre-therapy), after two months of training (mid-therapy), and following completion of the intervention program (post-therapy).

The Present Study

The Objectives of the Study:

1. To develop a package consisting of Transactional Analysis (TA) and Biofeedback Strategies (BFS) for enhancing academic motivation.
2. To study the efficacy of the combined model of TA and BFS in improving academic motivation among school students.

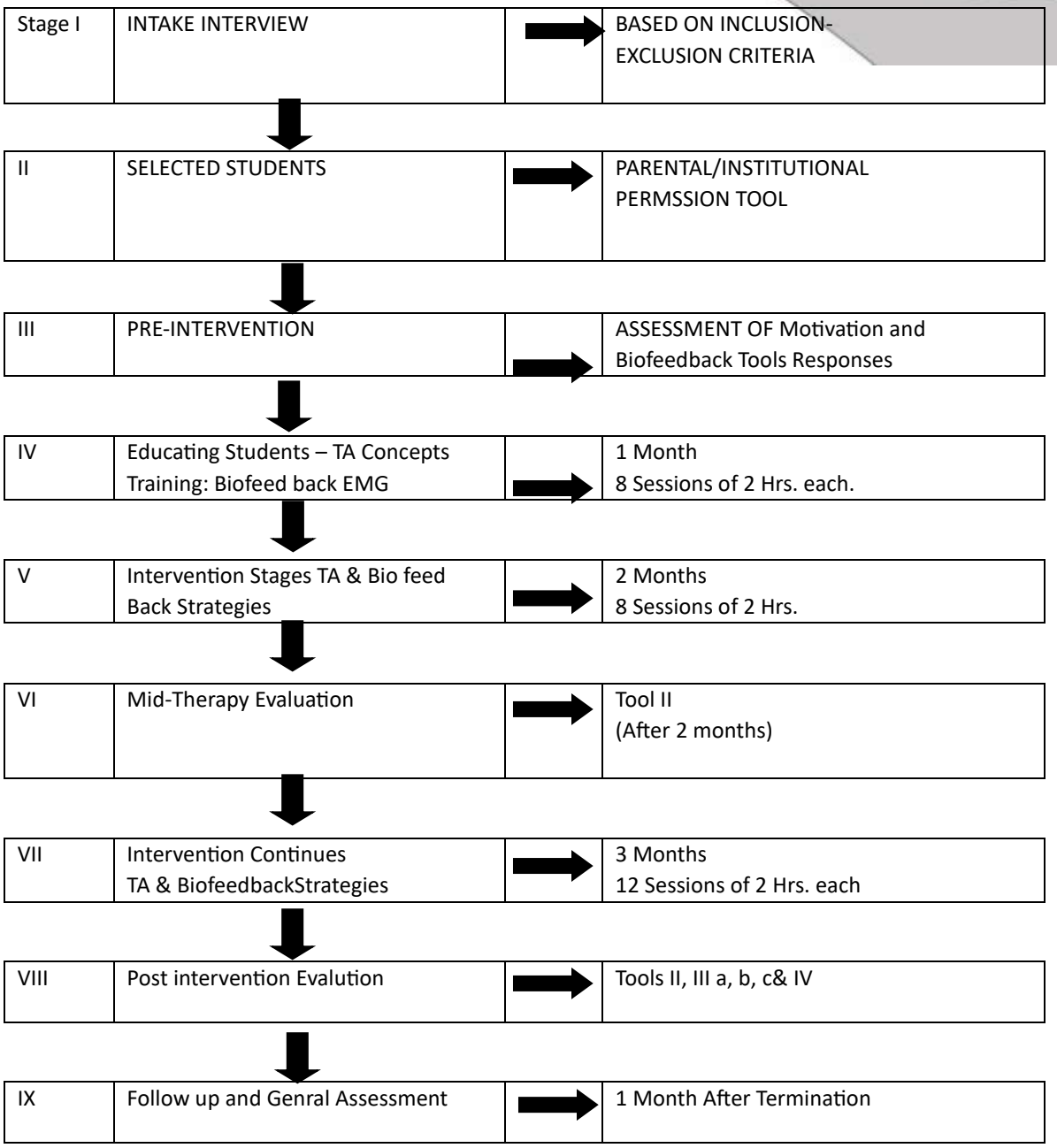
PROBLEMS TO BE INVESTIGATED:

1. A combined model of TA and BFS is effective in improving academic motivation among teenage students.
2. Adult awareness (TA) and muscular relaxation of the student simultaneously improve as a result of understanding TA concepts and self-monitoring through BFS.

EXPERIMENTAL DESIGN:

The design selected was the single-group outcome study with multiple assessments. The combined effect of TA and EMG was evaluated as a therapeutic program in a sample of school students. The assessment done before the therapeutic intervention (pre-therapy assessment) was repeated after two months (mid-therapy assessment) and repeated after termination of the intervention program (post-therapy assessment).
The experimental design is illustrated in the flow chart (Fig. 1)

EXPERIMENTAL DESIGN:



Tool I: Form of consent from Parent/ Institution
Tool II: Academic Motivation Scale
Tool III: Structural Analysis /Ego gram TA
Tool IIIa : Self Report
Tool III b: Structrogram –TA
Tool IV : Biofeedback Responses

Dropout, if any, during/immediately after stage IV will be given 2 extra sessions if they are willing to continue. Subjects Irregular during stages V, VI, & VII were excluded.

METHOD:

SAMPLE:

A sample of 32 students in the age group 13 to 15 years included seventeen boys and fifteen girls. The students belonged to a Higher Secondary School of Central India, studying in the eighth, ninth and tenth classes respectively. The students were selected using purposive random sampling at the school level. They belonged to

low or middle socioeconomic status. Participation was voluntary. Eight students were selected apart from the 32 students who satisfied the criteria and were also given training to maintain the dropout rate.

The Criteria for inclusion were as follows:

Inclusion Criteria

1. The ages of the students were between 13 and 16 years
2. Those students who scored low or medium on the Academic Motivation Scale.
3. Children whose school performance was low or medium, as recommended by the class teacher.
4. Children whose parents and teachers gave consent for the study with a low or medium score on AMS.
5. Those students who volunteered for the study with a low or medium score on AMS.

Exclusion Criteria

1. Students who scored above the cut-off point on the Academic motivation tool.
2. Students with a known History of Psychiatric illness.
3. Students with below-average intellectual functioning and other developmental disorders, like learning disability, were excluded from the study.
4. Those students who volunteered for the study with a high academic motivation were also excluded.
5. Students belonging to other schools apart from the school selected for the study were also excluded from the study.

Tools:

1. Academic motivation Scale (Vallerand.R.J, 1992) measures three dimensions of motivation: intrinsic motivation (IM-Pleasure and satisfaction available from doing an activity), Extrinsic motivation (EM-behavior regulated through external means), and Amotivation (AM-neither intrinsic nor extrinsic). This scale assesses High School motivation and contains 7 sub-scales assessing three types of intrinsic motivation towards knowledge, accomplishments and stimulation, three types of extrinsic motivation (external, introjected and identified regulation) and amotivation.

Intrinsic Motivation (IM) refers to doing an activity for itself and the pleasure and satisfaction derived from participation (Deci, Ryan, 1985). Extrinsic Motivation, on the contrary to IM, pertains to a wide variety of behaviours which are engaged in as a means to an end and not for their own sake (Deci, 1985). Amotivation refers to when individuals experience feelings of incompetence and expectancies of uncontrollability.

2. Ego gram is the visual symbolization of the amount of energy that the person exudes in each of his Ego States relative to others at any time (Dusay, 1977). Ego gram is a bar graph indicating the redistributed situation of ego state energy. Critical Parent (CP), Nurturing Parent (NP), Adult (A), Free Child (FC) and Adapted Child (AC) are the ego state areas. Change is affected by altering the distribution of energy in different Ego states in an individual. It is based on the constancy hypothesis, which holds that the amount of psychic energy within a person is constant, say 100. An egogram is used to introduce awareness about the Ego state, which is active, inactive or overactive. By redecision, a person can redistribute the psychic energy in the proper ego state channels (George, 1981).

3. A structurogram is the bar graph for a total of 100 units showing the relative importance a person psychologically attaches to one form of structuring time over another. A structurogram helps a person to distribute time meaningfully. Six ways of structuring time are withdrawal, ritual, pastimes, games, activity and intimacy. Time vacuum is as painful as hunger (George1981). How a person spends his time depends on how okay he feels about himself and others, and the kind of stroke he is getting.

4. Electromyogram Feedback (EMG): A procedure that uses electronic instruments to measure, process and provide feedback reinforcing information with auditory and visual signals accurately, which is a technique of learning voluntary control over automatically regulated body functions. The processes that can be controlled include brain waves, muscle tone, skin conductance, heart rate, pain perception, etc. It is a therapy in which sensors are placed on the skin to detect muscle tension-related electrical activity. A biofeedback instrument translates the electrical levels into a description of the varying degrees of muscle tension. The electrical activity is measured in microvolts, and the Computer software converts it into the relaxation percentage of each person. For this study, the Advanced Biofeedback System for relaxation training model, Recorders & Medicare Systems (P)Ltd Relax 701 instrument, was used with these technical specifications. The unit consisted of 7 channels with

sensitivity values ranging from 1 to 1500microvolts per mm. The input impedance was less than 10Mohm. The unit was connected to a computer. While the unit is connected, the electrodes are connected to the brachioradialis muscles; visual feedback is displayed on the monitor, indicating a colour bar graph to relax the muscles, coded red for contraction of muscles and green when the person attains a relaxed state. Thus, the student gains insight into his physiological responses and learns to attain a relaxed state gradually without the instrument.

Procedure:

The data for the present study were collected from July 2011 to March 2012 from a Higher Secondary school in Bhopal. The study was conducted in two Phases.

Phase I consist of

1. Intake and Pre-intervention assessment.
2. Educating TA and BFS.

Phase II consists of

1. Interventions for TA and BFS.
2. Mid-therapy evaluation using Academic Motivation Scale.
3. Post-intervention assessment and follow-up.

Phase-I

1. **Intake and Pre-intervention assessment:**

The intake was done using a purposive random sampling technique. The selection was done according to the inclusion criteria. The Academic Motivation scale was administered to the selected sample. Those students who achieved low or medium on the academic motivation scale were chosen for the study, and their scores were noted for analysis. EMG-assisted relaxation percentage was monitored and observed. At this stage, the students were not taught to use the instrument independently.

2. Educating TA and BFS

During Phase I, students were trained in TA concepts in simple language. They were given the following information on TA: “TA concepts are simple. TA emphasises our own potential to decide and change our decisions. We are responsible for our thinking, feeling and behaviour. After eight hours of two-hour sessions each, you will be able to understand the following concepts, which you can use in your life.

1. Ego States
2. Strokes
3. Life Positions
4. Structuring Time
5. Transactional Analysis proper
6. Racket Analysis.

You will learn to sort out your Ego States by observing posture, gesture, and tone of voice. You will learn to give, accept and ask for strokes, otherwise called recognitions. However, if you get no stroke, you can learn to stroke yourself. Regarding Life Positions, you will be able to comfortably opt for the I’m OK, you’re OK level. Structuring time helps you to understand the ways you are spending your time. There are six ways: Withdrawal, Rituals, Pastimes, Psychological Games, Activity and Intimacy. You will be able to find out yourself how you can profitably use your time to get more effective strokes. We can change our Crossed and Ulterior transactions into Complementary ones by our conscious options”. Apart from TA concepts, students were given training to operate a biofeedback instrument and monitor their own muscular relaxation using Electromyogram feedback (EMG).

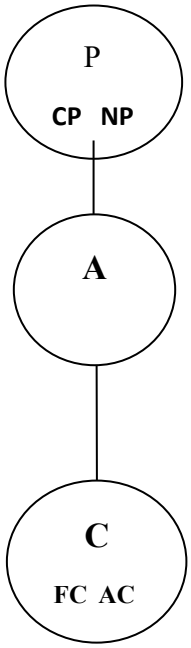
Phase-II

1. TA Skills Training:

Imparting TA Skills was interesting among teenage students. Ego states were taught by demonstration. Three Volunteers from among the students were called to represent P, A, and C, respectively. Parent (P) was further

divided into Critical Parent (CP) and Nurturing Parent (NP). Child (C) was divided into Free Child and Adapted Child (AC) (Fig 2). Blackboard was liberally used for drawing.

P (CP, NP), A, C (FC, AC)



In many situations, A is not free due to parental preoccupations, as illustrated in Fig 3.

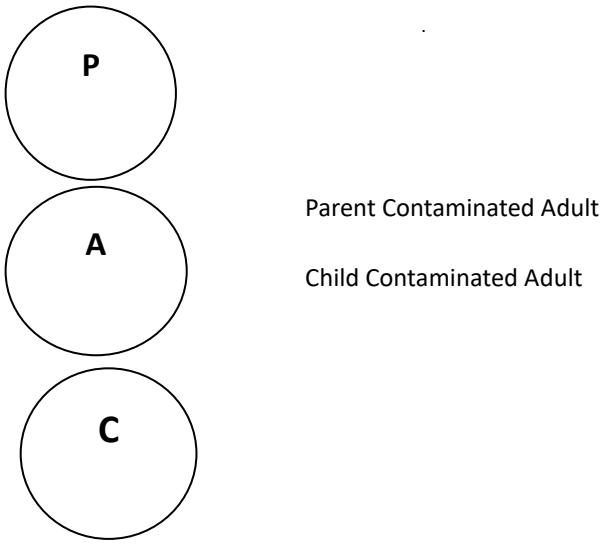


Fig 3. Preserving the Adult (A) Ego State, also known as cathecting the Adult Ego State, is the primary goal of intervention.

Three Chair Method: Another skill given in TA education is the Three Chair Method (TCM). Three empty chairs are placed, representing the Ego states P, A and C. In a problem situation, the student was asked to sit in chair C and next in chair P. They were encouraged to talk, feel and behave in the respective Ego states. After C-P transactions, the students will arrive at the here and now solution, finally occupying chair A, the adult awareness. Situation 1: Electricity power failure at night on the eve of the examination. The student is made to sit in the chair for Ego state C.

The Student in Chair C: Oh! I'm upset. Tomorrow is my math exam. I feel helpless."

Student interchanges his chair with Chair P: What is our electricity board doing? My father has not bought an emergency lamp so far! C-P transaction continues.

Finally, the student goes to Chair A. He thinks of options. He lights a candle with a matchbox. The student further learns to solve his difficult situations without the physical presence of the chair, using imagination and reaching better decisions.

Ego Gram is a visual symbolization of the amount of energy a person exudes in each of his ego states relative to others at any given time. (Dusay, J,1971). A structurogram shows how a person allocates their time. Time vacuum is considered as painful as hunger (George K, 1981). How a person spends their time depends on how okay they feel about themselves and others, and the kind of stroke they earn.

Racket is another TA concept. It is unpleasant repetitive feelings (Berne,1961), which can be illustrated with its six components. It is a continuous process like an electric circuit. Racket disappears when a disconnection in this cycle occurs. Disconnection occurs when the person consciously changes one of the components, for example, by updating their belief.

Thus, students learnt the concept of TA, and they were trained to present their problems using TA terminology. This method makes the problem less sentimental and more remedial in nature.

Electromyogram Feedback Assisted Relaxation Therapy: The treatment protocol for EMG feedback-assisted relaxation was developed based on the guidelines provided in the manual for the Relax 701 unit. The intervention program was initially designed to raise awareness among students, teachers, and parents, for which a medical camp was organised at the school. The students were informed that the device displayed muscle tension, with relaxation represented by green colour-coded bars and increased muscle contraction, which coexists with anxiety and stress, indicated by red bars on the device. The students were taught muscle relaxation exercises to reduce tension, along with Biofeedback training. The first session was conducted in a group to demonstrate how the device is attached to the body and to observe the readings. A common instruction was given to the students: "This instrument monitors and displays muscle tension of your body. Learn and try to relax all the muscles of your body as much as you can to gain the green bars on the monitor." The students were trained to operate the device independently to reduce the occurrence of red-coded bars. Each student was called individually into the room for the BFS sessions, and electrodes were placed on the brachioradialis muscles. Each session lasted 20 minutes, after which the relaxation percentage report was discussed with the student. The student also discussed personal problems during the post-feedback session.

Mid-Therapy Assessment

Each student was assessed using the Academic Motivation Scale (AMS) after three months to evaluate progress made during therapy. Feedback from the students, including their self-reports, was considered at this stage. A dropout in the present study was any student who exited the intervention program after therapy had commenced without prior notice. A few students who dropped out at this stage were replaced with other students selected through sampling.

Post Therapy Assessment and Follow Up:

After eight months, each student was assessed to study the impact of the intervention and to evaluate the overall progress made in the therapy. The Academic Motivation Scale, Egogram, Structurogram, and Electromyogram feedback were repeated on the thirty-two students selected for the study. The responses were recorded in a data sheet. A follow-up was conducted one month after the termination of the intervention. The students were trained to use the learned techniques independently, without a therapist, instruments, or the physical presence of the three chairs, as in TCM.

Results

The duration of the study was six months, followed by a general review at the end of the seventh month. The study group, consisting of 32 students, had 15 girls and 17 boys with a mean age of 14.5 years. The control group also had 32 students with the same gender proportion.

Results of Academic motivation scores:

The results of the statistical analysis obtained from the study were quantitatively and qualitatively analysed. Academic Motivation of 32 students belonging to the experimental group in their postintervention stages is shown in Table 1.

Variables	Mean	SD	t-value	Statistical significance
PRE	31.72	5.50		
IM			3.167	P<.01
POST	32.88	5.50		
PRE	37.06	5.08		
EM			4.225	P<.01
POST	41.53	8.23		
PRE	68.78	8.75		
IM+EM			4.630	P<.01
POST	74.41	11.40		
PRE	13.25	3.03		
AM			2.589	P<.05
POST	11.81	4.58		

Table 1 comparing the Mean, S.D., mean difference and level of significance of the Pre-Post Academic Motivation Scores.

From the results obtained on the academic motivation scale, we find considerable significance in the mean differences. This leads us to the conclusion that the interventions were significantly effective in improving academic motivation.

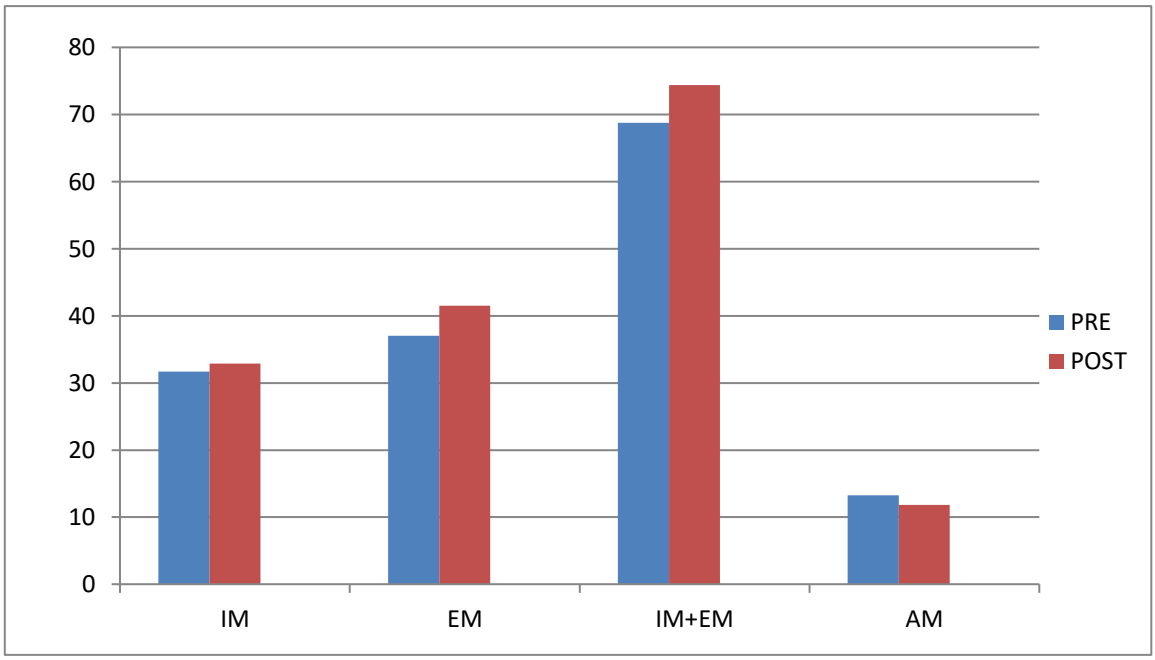


Fig.4. showing the academic motivation score of students in the pre-post intervention stage.

Results of EMG-assisted relaxation training:

The results obtained by students of the experimental group on the percentage of relaxation show the pre-score mean% as 55.84 and post mean% % of 63.28. The calculated t-value shows significance at the .01 level. The difference in the mean obtained is significant between the pre-intervention and post-intervention groups.

Fig.5 shows the pre-mean % score and post-mean % score of the experimental group on EMG-assisted relaxation training.

Results based on Egogram:

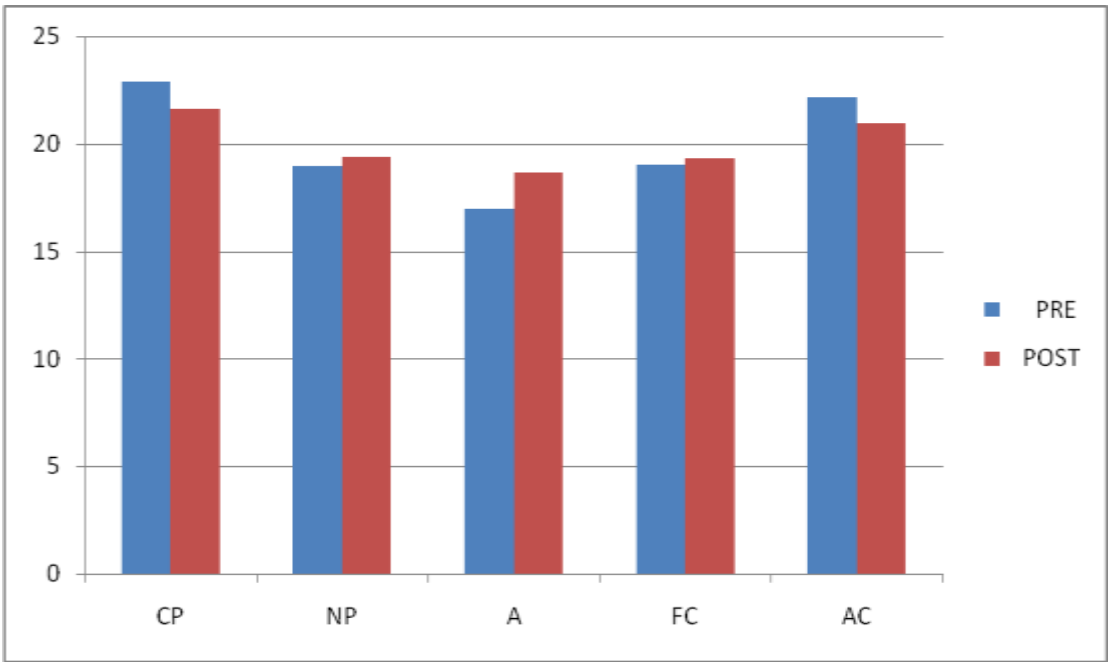


Figure 6 shows the pre-post percentage mean obtained by the students on the Egogram.

Results based on Structurogram:

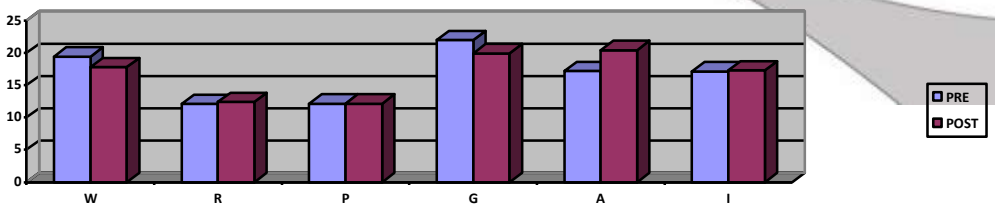


Fig 7 shows the mean percentage score obtained by the students on the Structurogram.

The pre-post comparison of the experimental group data shows significant changes in the intrinsic motivation, extrinsic motivation, combined academic motivation scores and also on the Amotivation scale. The pre-post comparison of the EMG relaxation percentage also enhanced after the intervention, which is significant at the .01 level. The changes observed on the Egogram showed specific and significant improvement in the CP, NP, and Adult and a reduction in AC post-intervention, which was also significant at the .01 level. There was no significant difference observed before and after intervention in the FC. The various components of the structurogram, including Withdrawal, Games and Activity, showed significant changes after the intervention. No significant change was observed in the Ritual, Pastime and Intimacy scale.

Experimental-Control group comparison on Academic motivation

A statistical comparison of the experimental and control group was done using an independent-samples t-test. The t-test was carried out on a group of N=32 in the experimental group and N= 32 in the control group for the scores attained on the academic motivation scale. The mean, SD, mean difference, t value and level of statistical significance were derived for the purpose.

Table 5 shows the mean, SD, t value and the level of statistical significance using independent sample t test between the Experimental group (EG) and Control group (CG) on the post-intervention assessment of the Academic Motivation Scale.

Subscales	Group	Mean	S.D	t value	stats sig
IM	EG CG	32.88 29.78	5.50 5.82	2.18	P<.05
EM	EG CG	41.53 36.06	8.23 7.96	2.70	P<.01
IM+EM	EG CG	74.41 65.84	11.37 9.85	3.22	P<.01
AM	EG CG	11.81 13.25	4.59 0.98	1.73	P>.05

There was no significant difference between the experimental and control groups before the intervention between the experimental and the control group as it was matched using simple random sampling techniques. The test of statistical significance at the post-intervention level on the sub-scales of IM, EM, IM+EM and Amotivation of the academic motivation scale showed significant differences in IM, EM, IM+EM between the two groups.

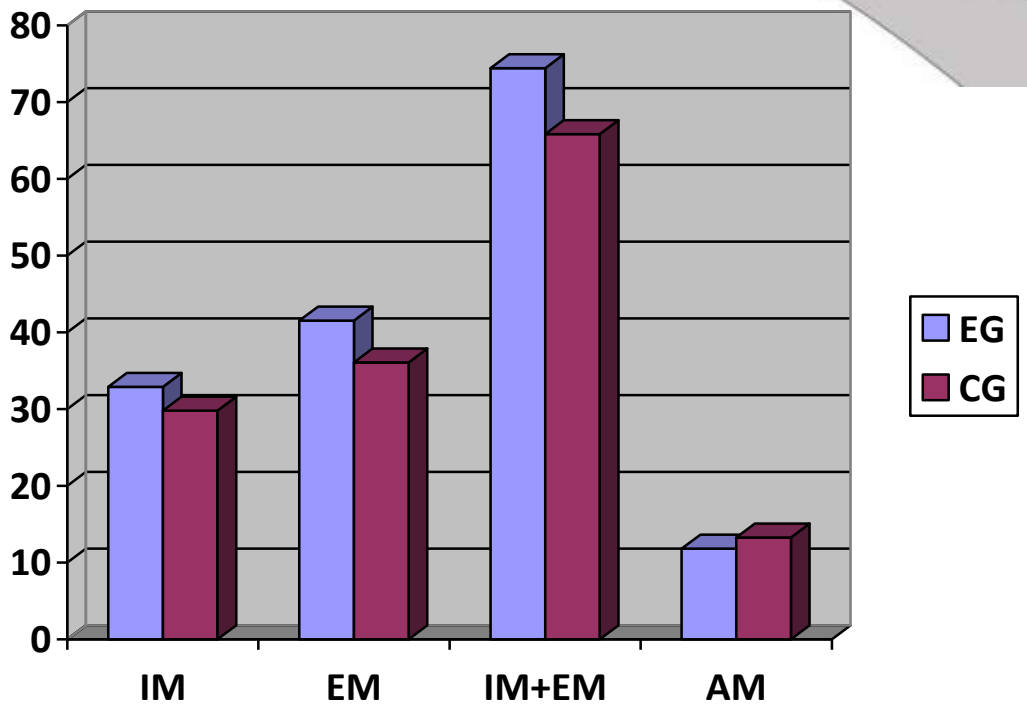


Figure 8 shows the graphical representation of the mean score obtained on the Academic Motivation Scale between the EG and CG in the post-intervention stage.

Summing up the results, we can observe the following significant changes:

1. Academic motivation scale (Vallerand, R.J, 1992) shows a remarkably significant increase in the Academic Motivation of students in the post-intervention stage. From 68.78 at the pre-intervention stage, the mean increased to 74.41 at the post-intervention stage. In the case of intrinsic motivation (IM) between the pre- and post-intervention stages, the difference in mean score from 31.72 to 32.88 was significant at the .01 level. The difference in the means in the case of extrinsic motivation (EM) before and after the intervention showed a significant difference from 37.06 to 41.53. The motivation mean score of 13.25 was reduced to 11.81 in the experimental group after the intervention.
2. EMG-assisted Biofeedback Relaxation also showed a high increase in relaxation at the post-intervention stage. From 55.84% at the pre-stage, the relaxation improved to 63.28%.
3. Egogram (Dusay, 1977) showed a significant increase in Adult at the post-stage. From 16.94% at the pre-stage, it went to 18.66%. There was also an increase in NP. Decreases in CP and AC are also significant. These changes indicate an overall increase in the here-and-now orientation of students.
4. Structurogram (Berne,1972) results are self-explanatory. Activity (Act) showed a highly significant increase from 17.19 to 20.44. Equally significant is the decrease in withdrawal and Game (G). These changes indicate increased attempts on the part of the students in structuring their time.

Gender wise difference is not that significant. While the difference in the pre-post condition in the case of boys was 6.06, the corresponding change in the case of girls was 5.14; however, this did not make it significant between the boys and girls of the experimental group.

The control group, consisting of 32 students with the same proportion, showed no significant change in the pre-post stages. Academic motivation declined by 1.28 at the post stage. Amotivation increased by 0.35, which is negligible. However, we found a significant difference between the experimental group and the control group in their differences in academic motivation at the pre-post intervention stages. The IM mean score between the experimental and control groups showed a significant difference. The mean score of 32.88 in the EG and 29.78 in the CG shows a difference of 3.10 between the two groups. The difference in the mean score in extrinsic

motivation between the EG and CG of 3.10 shows a significant difference between the two groups, which is significant at the .01 level. There is a significant difference between the mean score of IM+EM in the experimental and control groups. The amotivation score was 11.81 in the EG and 13.25 in the CG. The higher mean score in the CG shows the reduced motivation in the CG group, which is statistically significant at the .05 level. Pre-assessment scores show no difference between the EG and CG as described in Table 6.

Conclusion:

By learning TA concepts like Egostates, Strokes, Structuring time and Life positions, students gain awareness and acquire better coping skills and make proper decisions. Their increased relaxation and voluntary management of muscular tension considerably contributed to increased academic motivation, particularly when a biofeedback strategy is used for self-monitoring. Working on EMG and GSR, students voluntarily learn relaxation and gain confidence. Twenty-three out of thirty-two showed enhanced academic motivation as a result of interventions, recording 71% success. Decision for change and Awareness through TA and monitoring the change using BFS led to a considerable increase in academic motivation.

TA methods ⟶ introduce clarity in decision-making.

BFS through EMG⟶ self-monitoring of physical relaxation.

Both these inner and outer components are managed by the self with awareness, leading to gaining clarity in goal setting and enhancement of academic motivation. It has to be pointed out that the sample consists of students with low motivation. The control group and experimental group of 32 each were at the same levels in their academic motivation. The experimental group (EG) was given training in TA concepts and BFS using EMG, while the Control group (CG) received no training.

Limitations and Scope of the Study:

Students were given the TA basics necessary for confidence building and redecision. Minimum training was only given in using EMG and GSR to monitor self-relaxation. There is scope for expanding the method, taking teachers and parents also as participants. There is also scope to utilise the method in other areas of education.

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