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Research Paper

Efficacy of Cognitive Drill Therapy in Managing test Anxiety of Students

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ABSTRACT

Background: Cognitive Drill Therapy (CDT) involves verbal exposure to the conditioned stimuli including feared consequences by changing the time perspective in conditions of excessive, unreasonable and irrational fears. Test anxiety is a common feature in students particularly those who appear in competitive examinations. ***Aim:*** In the present study, we explored the role of cognitive drill therapy in test anxiety of students. Method: A sample of 100 young students participating in coaching for engineering examinations was sampled through purposive sampling. The sample was further allocated to two groups: Group-I: Study Group (n=50) and Group-II: Control Group (n=50). Cognitive Drill Therapy was applied to Group-I and no intervention was given to Group-II. Both the groups were assessed on Test Anxiety Questionnaire at baseline and at termination of the cognitive drill therapy. A 2x2 repeat measure design was used. Results: The analysis of data revealed that there was no change in control group on pre-post status whereas the test anxiety score of study group dropped significantly. Conclusion: Cognitive Drill Therapy can be considered as a viable and efficacious intervention for dealing with test anxiety in students.

Keywords: *Cognitive Drill Therapy (CDT), Test anxiety, Examination Anxiety, Exposure Treatment, Behaviour Therapy, Cognitive Behaviour Therapy.*

Test and exam situations are repetitively faced by students in their career path and the performance in these situations become source of anxiety in many students. Certain amount of anxiety can be healthy and motivating to the students to perform at the optimum level (Akanbi, 2013). However, some of the students become over-anxious which tend to negatively affect their performance in test situations (Keogh, Bond, French, Richards, & Davis, 2004). The experience of anxiety interferes in attentional and memory processes which more or less inhibit retrieval of memorized content temporarily (Tse & Pu, 2012). The experience of anxiety involves bio-psycho-social factors. From a cognitive perspective, the

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interpretation of the situations is considered as the main determinant of anxiety experience. According to Spielberger (1966) "individuals' affinity to interpret the stimuli around within their personal threat framework underlies anxiety". Ellis (1994) defined anxiety as "the unsettling emotional situation which arouses the sense of weakness against an anticipated danger". An anticipation of danger is the key feature in anxiety. The danger may relate to the very existence of an individual, integrity of self, or threat to the social status or survival of oneself or others who are somehow connected with the individual. It is the personal context of the situation that usually elicits the emotion of anxiety. Anxiety has survival value but in certain situations, people experience anxiety even when there is no threat to the survival as such. Pathological anxiety becomes the focus of clinical attention.

A looming fear of failure and physiological over-arousal are the characteristic features of test anxiety (Schouwenburg, 1999). Test anxiety often leads to barriers in learning and performance (Andrews & Wilding, 2004). It is a feeling of uneasiness and apprehension before, during and may be after the test Shokrpour, Zareii, Zahedi, & Rafatbakhsh, 2011). Test anxiety can be experienced by the people of all ages who are to be evaluated, assessed and graded (Lufi, Okasha, & Cohen, 2004); at all grade levels – primary, secondary and tertiary (Hernandez, Menchaca, & Huerta, 2011).

Yerkes-Dodson law in 1908 is invoked to explain the relationship between test anxiety and performance (Buchwald, 2010). Anxiety leads to gains in performance up to a certain level and thereafter it begins to impair the performance. Hill and Wigfield (1984) reported that when counselors intervened, the performance of students with high levels of anxiety actually improved.

Cognitive Drill Therapy (Kumar, 2017a; Jain, 2016; Kumar et al. 2012) capitalizes on the principles of behavior therapy and cognitive therapy for exposure at verbal level for the feared situations and the feared consequences. Case studies of Cognitive Drill Therapy report success with a variety of conditions involving irrational and excessive fears. For example, obsessive-compulsive disorder (Kumar et al. 2012); agoraphobia (Dwivedi & Kumar, 2015); social evaluation anxiety (Arya, Verma, Kumar & Mishra, 2018); specific phobia (Arya, Verma,& Kumar, 2017a); illness anxiety disorder (Shabina, Jain, Singh & Kumar, 2018). So far no group design study has been conducted on the application of cognitive drill therapy. The present study was designed to test the efficacy of cognitive drill therapy (CDT) in test anxiety of students.

Hypothesis

- Cognitive drill therapy will be efficacious on test anxiety of students.

METHODOLOGY

Research Design

2x2 group design with repeat measures.

Sample

A sample of 100 young students participating in coaching for engineering examinations was sampled through purposive sampling. The sample was further allocated to two groups: Group-I: Study Group (n=50) and Group-II: Control Group (n=50). Cognitive Drill Therapy was applied to the participants of the study group and no intervention was applied on the participants of control group. The participants in the age range of 16-18 years constituted the sample. There were 66 boys and 34 girls in the sample. The participants who were high on test anxiety and those who willingly agreed to participate in the process were included.

Outcome Measure

1. **Test Anxiety Questionnaire (TAQ)** by Nist & Diehl(1990) was used to measure the level of test anxiety as baseline and at post intervention. It is a 10-item questionnaire with 5-point rating scale. Each item is rated on 1-5 with a minimum score of 10 point and maximum score of 50 points. A score of more than 35 is considered as unhealthy anxiety. The students having a score of 36 or more were included in the study. TAQ is being used in similar researches on test anxiety (e.g., Salehi, GhanizadehRostami, 2017; Abd el–Aziz, Eid, & Safan, 2012; Fard, 2013).
2. **Visual Analogue Scale (VAS):** A 10 point VAS was used to rate level of anxiety during application of cognitive drill. 1 means no anxiety and 10 means maximum anxiety. Subjective monitoring of anxiety level on VAS is utilized to tweak the cognitive drill on moment to moment basis.

CDT Protocol

OBSD Analysis: Cognitive Drill Therapy (CDT) utilizes a behavioural analysis of the feared situation into four components, called as OBSD Analysis.

1. **Objects**: All objects/situations that trigger fear reaction e.g. exam situations, social situations, specific place places which are closed or crowded, infections, insects, animals, crowd etc. In the context of test anxiety, the situations and tasks related to test were found to be associated with test anxiety such as approaching exams, announcement of schedule of examination, class tests etc.
2. **Body-Mind Reactions (BMR):** The bodily and psychological reactions triggered by actual exposure to the object of fear or on mere thought of the feared object. The affected individual might report body-mind reactions like accelerated heartbeat, difficulty in breathing, dryness in mouth, lack of concentration, dizziness etc.
3. **Safety Measures**: Since the affected individual perceives the object/situation as dangerous the natural reactions are of avoidance or escape. The person tries to safeguard himself/herself against phobic reactions by using these measures. In test situations, the usual safety measures are studying for extended hours and not taking break, cutting on social interactions and leisure and play activities, considering escaping from exam, developing somatic complaints before examination and so on.
4. **Feared Consequences**: The feared cognition related to the possibility of threat such as fear of failure in test situation, fear of humiliation, fear of losing respect, fear of

spoiling social image of parents and so on. Following feared cognition were specifically identified:

a) I will fail in the test
b) My rank will be spoiled
c) My parents will be ashamed of me
d) My parents will be angry with me
e) My reputation in the class will suffer
f) Teachers will make fun of me
g) My future will be spoiled
h) My friends will be successful and I shall be left behind
i) Relatives will come to know of my failure and make fun of me
j) The dreams of my parents will shatter
k) I will let my parents down

A comprehensive OBSD analysis is performed. In the next step, timeframe of feared cognition is modified. As a rule, the feared cognition point out to some danger in future time perspective which is changed to present/past time perspective. For example, I may fail in examination (feared cognition); I have failed in examination (time perspective changed). All key feared cognition are changed in this manner.

Psycho-education: In CDT, specific psycho education is conducted in which a person is told that feared cognition is the basis of excessive fears. Feared cognition and emotional experience of anxiety are functionally connected. All feared cognition point out to a danger in future time frame. In CDT, the time frame of feared cognition is changed which are then to be repeated. The repetitions of feared cognition in this manner would elicit BMR, which will decline with repetitions and pauses in between. If there is a high escalation of fear, a pause of 15-30 seconds may be given. There is a pattern in activation and resolution of BMR which is called as anxiety curve. The repetitions of feared cognition produce extinction/habituation of anxiety response, so that the idea of failing in test would produce normal and healthy level of anxiety.

Cognitive Drill: In cognitive drill, the feared cognition in past/present time perspective are to be repeated frequently until it fails to elicit Body-Mind Reactions or there is substantial drop in the level of BMR. The aim is to cover all the feared cognition in the drill so that it no longer elicits high level of anxiety. Following cognitive drill statements were formulated:

a) I have failed in the test
b) My rank has been spoiled
c) My parents are ashamed of me
d) My parents are angry with me
e) I have lost my reputation in the class
f) Teachers are making fun of me
g) My future has been spoiled
h) My friends have become successful and I have been left behind
i) Relatives know that I have failed and are making fun of me

Execution of Cognitive Drill: Execution of cognitive drill was done in a one to one setting. A participant was asked to imagine himself/herself in the test situation and repeat the drill statements one by one. The BMR ratings were monitored every 30 seconds through Visual Analogue Scale (VAS). If it became too uncomfortable 7 or more on VAS for the participant, a pause of 15-30 seconds or longer was given before resuming. The drill was done one by one on statements. The pass criterion for moving to the next drill statement was nil or low activation of BMR on three consecutive presentation of a drill statement.

A session of CDT lasted from 45 minutes to 90 minutes. In the present study, 3-8 individual sessions were conducted. All assessment and CDT intervention were done by the second author. Post-intervention assessments were conducted after three weeks of baseline assessment and upon completion of the CDT intervention. Home work of CDT was recommended to the participants and they were encouraged to apply cognitive drill as and when they feel stressed and anxious in test situations.

RESULTS

Table-1: Mean & S.D. of TAQ Scores

Groups	Baseline	Post-Intervention
Study Group	41.80±4.06	25.20±6.38
Control Group	40.92±3.73	40.18±3.31

Table-1 and Figure-1 reveal that on baseline the mean scores of both the groups were almost equal whereas on post-intervention assessment the study group scored substantially less than the control group and the control group had almost the same status on follow up.

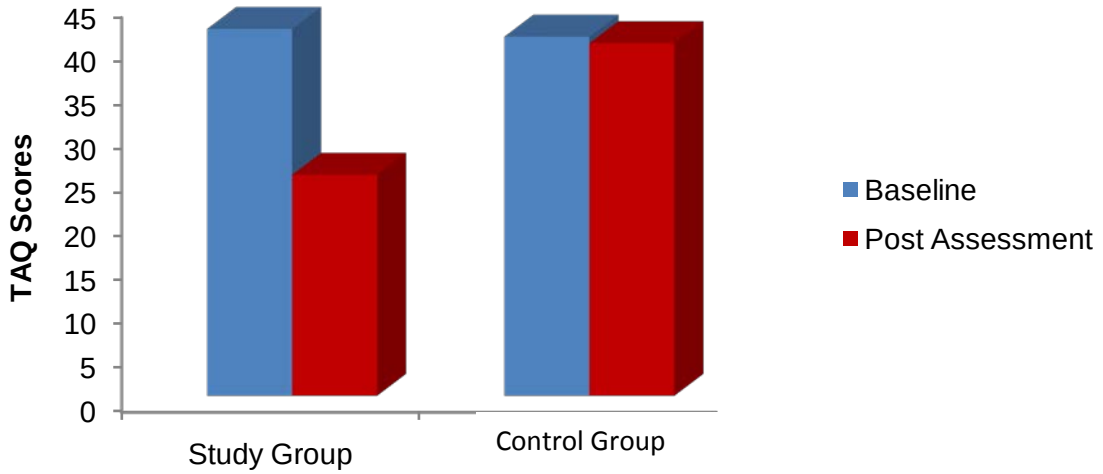

Figure-1: TAQ Mean Scores on Pre-Post Test in Two Groups

2x2 Repeat Measure ANOVA was computed in SPSS. There was significant effect of both Time (baseline vs. post-intervention) on participants' scores ($F(1,98) = 173.35$, $p > .01$, and Time x Groups ($F(1,98) = 145.02$, $p > .01$. The between subjects effect was also significant ($F(1,98) = 128.16$, $p > .01$.

Independent t-test were computed for baseline and post-intervention scores of two groups. The t-value at baseline was 1.13, non-significant and at post-intervention t-value was 14.73, significant at .01 level. The value of paired t-test of study group for baseline vs. post-intervention was 15.38 significant at .01 level and the paired t-test of control group for baseline vs. post-intervention was .98 which was not significant. The results clearly reveal that the mean scores of study group on post-intervention dropped to 25.20 which is far below the cut off scores of 36 for high anxiety on TAQ. Cognitive Drill Therapy was efficacious in reducing test anxiety in the study group.

DISCUSSION

The results of the present study suggests efficacy of cognitive drill therapy in reducing test anxiety in the students. CDT capitalizes on multiple theories of psychology that include cognitive and behavioural theories (Kumar, 2017a; Kumar, 2017b; Kumar et al. 2012; Jain, 2016). In addition to that, there is a working hypothesis of neural correlates of time perspective, i.e. the pathways of future cognition and past/present cognition are not identical (Kumar, 2017a). Specific psycho education helps in attribution of fear to feared cognition. OBSD analysis, facilitate this attribution process. One of the questions asked to the affected person is that when he/she no longer would delve into the feared cognition, what would be the outcome? More specifically, when the mind will not entertain the idea of failures repetitively what would be the experience? This question helps in grasping the cognitive determinants of anxious behaviour. Most of the time people respond that there would be less or no fear. Having refocused on this point, the relevance of functional connection between feared cognition and affective experience of fear is delineated. It is emphasized that the feared cognition due to repetitive practice and conditioning has become associated with fear reaction. The repetitive verbalizations of feared cognition by changing the time perspective would result in habituation and a decreased fear reaction. Additionally, it is explained that the time perspective can be understood through notations. Past time perspective as A, present time perspective as B and future time perspective as C. The time perspective may have different neural pathways. The feared cognition of future time perspective travels to pathway C in the brain. A and B travel to other pathways in the brain. When drill statements are repeated, new neural connections are formed which are not connected to the fear response. It does not delete the existing C connections, instead more and more A and B neural networks are formed. Also, future oriented cognition is associated with fear response whereas past and present cognition is not. So, in essence, CDT helps in new learning that feared cognition is just a cognition, not necessarily an objective reality, also that the objective reality if it turns to be, it won't be that much catastrophic. Cognitive drill produce alternative interpretation of perceived events.

Because of existing conditioning, overt and covert stimuli associated with test situations reflexively elicit fear response. Actual objects in external world, the cognitive representations of those objects and situations including the linguistic representations of them serve as conditioned stimuli. The repeated presentations of those conditioned stimuli at verbal level decrease the fear response due to the process of extinction and habituation.

Exact mechanisms of action of CDT are yet to be understood. As a whole it belongs to the family of exposure therapies. Exposure to feared situation is known to have an effect of de-linking fear from its conditioned stimuli. Future studies will further enhance understanding of underlying mechanisms of action of Cognitive Drill Therapy.

So far, it can be said that verbal exposure acts on the irrational and excessive fear response which is also demonstrated in previous studies on phobias and OCD (Dwivedi & Kumar, 2015; Kumar et al, 2012; Khan et al. 2018; Shabina et al. 2018; Srivastava, 2018).

CONCLUSION

Verbal exposure is efficacious in dealing with test anxiety in students. Verbal exposure to conditioned stimuli and feared cognition provides greater flexibility and control over implementing exposure treatment. Further studies are required for both understanding its utility in irrational fears in diverse context and understanding the mechanisms of action. The present study has a limitation that no follow up was conducted to assess maintenance of acquired gains. The future research would take into account this limitation and incorporate proper follow ups. Also, there was no sham treatment to the control group. There remains a possibility that non-identified factors of therapeutic attention might have confounded the results.

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Conflict of Interest

The authors colorfully declare this paper to bear not conflict of interests

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