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A Comparative Study of Psychological, Medical and Compact Models on Treatment of Improving Symptoms of Panic Disorder among Students

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Abstract: The aim of present research is to study three main different methods on treatment of improving symptoms of panic disorder among Iranian students (39 = M, 21 = F, 12-19 ages). The sample was drawn by means of purposive sampling. Those suffering with four or more of thirteen symptoms indicated as component of panic attacks in DSM-IV classification were included in sample. The sample was divided into four groups in terms of nature of intervention as follows: Group 1: subjects given Pharmacological intervention; Group 2: subjects given psychotherapeutic intervention. Group 3: subjects given both the above interventions (compact model); Group 4: subjects given no intervention. The results obtained indicate that therapeutic intervention reduces panic symptoms. The three treatment models used were all effective. The maximum benefit was found to occur with compact model followed by pharmacological therapy and then psychotherapy. Significant differences in number of symptoms experienced pre and post intervention were however highly significant in all three cases. In terms of age the lower age group responded more to pharmacotherapy than the other models of treatment. The upper age group on the other hand was most benefited by the compact model but did not draw much benefit from pharmacotherapy and psychotherapy alone. It may be concluded that although compact model is most effective in terms of reducing panic symptoms, more research, particularly of a longitudinal nature needs to be undertaken to understand its advantages and disadvantages.

Key words: Panic symptoms, pharmacotherapy, psychotherapy, compact model

INTRODUCTION

Iran is located in the Middle East region and has a population of about 70 millions. By virtue of the fact that young and adolescent people constitute a high percentage of its population it is referred to as a young country. Iranian population has suffered a lot during the last two and three decades till present times. For example during Iran-Iraq war between 1980-88 and after war there were severe problems. As an Dezfoul city example (south west of Iran and having nearly 500,000 population) alone was attacked with more than 1000 missiles and rockets during the eight years of war. One of the most predominant problems of contemporary society is increase in anxiety which has taken the form of almost an epidemic. It not only detracts from the quality of life because it is an experience having negative connotations, it is also a situation often predictive of serious pathology. Physical as well as psychological symptoms accompany this experiences pathology. Although it may exist without being a disorder in the conventional sense, it is observed that an increasing number of cases are falling within the gambit of DSM IV classification. Even amongst young children and adolescents, it is increasing in all societies for different

reasons. In the developed societies the reason may not be related to the socio-psychological climate which distances children from care givers. In developing societies where the country is struggling to reach desirable levels of growth and aspirations for activities like higher education can not be fulfilled due to infrastructure and financial constraints, it becomes an important reason for increased experiences of anxiety. Goodwina *et al.* (2005) demonstrate that anxiety disorders are highly prevalent and that rates of illness are fairly uniform across cultures. It is, therefore, pertinent that at this young stage, children with such vulnerabilities, propensities be apprehended so that through appropriate intervention strategies, help is given before panic disorder becomes full blown.

It is extremely important that social science research should focus on trying to find out ways and means to alleviate anxiety, especially amongst young people because without this they cannot reach their full potential and develop into healthy personalities. DSM IV-TR recognizes and lists six principle diagnoses of anxiety disorders namely phobic disorders, panic disorders, general anxiety disorder, obsessive-compulsive disorder, post-traumatic disorder and acute stress disorder. Each has its unique symptoms but there are certain core

symptoms which all anxiety disorders share. Anxiety is primarily a multidimensional construct manifesting physiological, behavioral and cognitive symptoms. Physiologically, the autonomic nervous system produces physical symptoms such as flushed face, perspiration, trembling and stomach pains (DSM-IV-TR, Anxiety Disorder chapter). Children with anxiety have also been shown to have increased heart and respiration rates. At the physiological level, anxiety manifests itself differently in different persons. The common reported bodily signs and symptoms of anxiety involve the respiratory system, the alimentary and excretory symptom, the skeletal-muscular system and their behaviors like numbness, restlessness, tiredness, body pains, restlessness and disturbances relating to sleep (Westen and Morrison, 2001). Thus, some persons may experience greater disturbances of cardiovascular system, others of gastrointestinal system, or the genito-urinary system. For some, headaches, muscle tension or spasm may be frequent. Behaviorally, anxious children often avoid feared stimuli and situations and display shaky voice, rigid posture, crying, nail-biting, or thumb-sucking. At the cognitive level intrusive and unwanted thoughts, unwanted and faulty attributions are most notable (Clark *et al.*, 1999).

Valentinet *et al.* (2004) reported anxiety disorders to be the most common disorder amongst youth. Benjamin *et al.* (1990) found that anxiety disorders appear four times as often as behavioral disorders by children's report (9.9 versus 2.6%). Symptoms of panic disorder, as listed in DSM-IV-TR are given below: (1) palpitations, pounding heart, or accelerated heart rate; (2) sweating; (3) trembling or shaking; (4) sensations of shortness of breath or smothering; (5) feeling of choking; (6) chest pain or discomfort; (7) nausea or abdominal distress; (8) feeling dizzy, unsteady, lightheaded, or faint; (9) de-realization (feelings of unreality) or depersonalization (being detached from oneself); (10) fear of losing control or going crazy; (11) fear of dying; (12) paresthesias (numbness or tingling sensations) and (13) chills or hot flushes.

Because physically problems panic sufferers usually consult with physician before they see a psychologist, pharmacotherapy is typically the first kind of treatment people get Pharmacological therapy. Pharmacotherapy, is based on the assumption that panic disorder arises from disturbances in the neurobiological systems; hence, the aims of the treatment are regulations of neurotransmitter systems. Medicines used in the treatment of panic disorders and symptoms have been exposed to intensive research. In total about 25 drugs have been investigated. Drug classes most frequently studied were benzodiazepines (BZD), tricycles antidepressants (TCA)

and Selective Serotonin Reuptake Inhibitors (SSRI) (Giovanni *et al.*, 2005; Naomi *et al.*, 2004).

Non response to pharmacotherapy for Panic Disorder (PD) is a well-documented problem. Therefore, strategies for these non-responders should be researched. Several studies support the efficacy of psychotherapy for panic disorder (Alicia *et al.*, 2005; Shawn *et al.*, 1999). Since the late 1980s there has been tremendous progress in the non-pharmacological treatment of anxiety disorders. Cognitive-behavioral therapies, which reflect a recent integration of the cognitive theories and methods and the behavior theories and methods of B.F. Skinner and Ivan Pavlov have the greatest degree of empirical validation. Even panic disorder, which has been said to be the most disabling of the anxiety disorders in terms of social and occupational functioning has responded very favorably to these cognitive-behavioral techniques. Other anxiety disorders for which cognitive-behavioral approaches have been particularly effective include social phobia (both generalized and no generalized type), obsessive-compulsive disorder, specific phobia, social phobia and generalized anxiety disorder. Further validation is needed for two recently developed treatments for posttraumatic stress disorder, one based on exposure methods and the other based on classical conditioning (Eye Movement Desensitization and Reprocessing (EMD/R) (Mitte, 2005). Further research is needed to identify effective components of treatment and to determine whether certain subtypes of patients may require certain components of panic control therapy over others. In clinical practice, for example, it appears that a substantial number of patients with panic disorder respond well to education and breathing control alone whereas others seem to require more extensive treatment. Thus, compact model of treatment namely combination of pharmacological and psychotherapeutic intervention may sometimes be advisable (Gosselin *et al.*, 2006; Bruce *et al.*, 1999; Otto *et al.*, 1999).

Clum *et al.* (1993) in a meta-analysis, compared the effectiveness of psychological and pharmacological treatments for panic disorder. Percentage of agoraphobic subjects in the sample and duration of the illness were unrelated to Effect Size (ES). Type of dependent variable was generally unrelated to treatment outcome, although behavioral measures yielded significantly smaller ESs than did depression measures. Choice of control was related to ES, with comparisons with placebo controls greater than comparisons with exposure-only or other treatment controls. Psychological coping strategies involving relaxation training, cognitive restructuring and exposure yielded the most consistent ESs flooding and combination treatments (psychological and

pharmacological) yielded the next most consistent ESs. Antidepressants were the most effective pharmacological intervention.

Öst and Breitholtz (2000) investigated the efficacy of a coping-technique, Applied Relaxation (AR) and Cognitive Behavior Therapy (CBT), in the treatment of panic disorder without agoraphobia. The patients were treated individually for 12 weekly sessions. The results showed that both treatments yielded very large improvements, which were maintained, or furthered at follow-up. There was no difference between AR and CBT on any measure. There were no relapses at follow-up, on the contrary 55% of the patients who still had panic attacks at post-treatment were panic-free at follow-up. Besides affecting panic attacks, the treatments also yielded marked and lasting changes on generalized anxiety, depression and cognitive misinterpretations. The conclusion that can be drawn is that both AR and CBT are effective treatments for panic disorder.

Gilbert (1998) reported that many breathing exercises originating within the yoga tradition have broad value for therapeutic and rehabilitation purposes. They are generally based on sound physiological principles and though designed for more esoteric goals, can serve well for promoting relaxation, optimal lung function, emotional balance and self-regulation of various kinds. Fundamental principles of yogic breathing (diaphragmatic breathing, nasal vs mouth breathing, slow exhalation with pauses, smoothness and steadiness, self-observation of breathing) are discussed. Four basic exercises are described: three-part complete breath, alternate-nostril breathing, post-exhale pause and skull shining.

Roth *et al.* (1998) assessed the ability to relax in 14 patients with Panic Disorder (PD) and 15 non-anxious control subjects for 10 min. Before and after relaxation, subjects performed a standardized activating task of talking continuously for 4 min. Skin conductance suggested autonomic instability during quiet sitting in patients who panic or who are prone to panic.

Starcevic *et al.* (2004) reported a study in which patients with Panic Disorder with Agoraphobia (PDA) were treated with Cognitive-Behavioral Therapy (CBT) alone, CBT plus a high-potency benzodiazepine (CBT, BZ) or CBT combined with BZ and an antidepressant, fluoxetine (CBT, BZ and AD). On the basis of their clinical judgment and collaborative negotiation with the patient, psychiatrists chose one of the three treatment modalities for 102 PDA outpatients. Patients in all three-treatment groups showed significant reduction in symptoms during intensive treatment and reached similar end states.

It appears from the resume of study in the area of panic disorder cited earlier that pharmacological as well as

psychological interventions have proved useful in the treatment of panic disorder. Understandably, the compact model, which utilizes both types of therapies, has been found most effective. However, most studies reported have been conducted in European and American countries. It would be useful if information about responses to these therapies in other cultures and different age and gender groups becomes available.

As discussed Iran is one of the countries in which the incidence of panic disorder is on the rise, yet, no systematic studies regarding interventions are available. Therefore, the present study has been conducted in Iran. Another interesting feature visualized is to study subjects who do not have full blown panic attacks, that is, they are not PD patients, but show vulnerability in the sense that they manifest four or more symptoms associated with PD. Thus, the present research studies Iranian school children, both males and females, falling in the age range 12-19 years, who are manifesting four or more panic symptoms. The following hypotheses have been formulated by the researcher:

- No. of panic symptoms become significantly reduced after therapeutic intervention
- No. of panic symptoms become significantly reduced after pharmacological therapy
- No. of panic symptoms become significantly reduced after psychotherapy
- No. of panic symptoms become significantly reduced after combined pharmacological and psychotherapeutic intervention (compact treatment)
- There will be no reduction in No. of panic symptoms in subjects not given intervention
- Psychotherapy will result in greater reduction of panic symptoms than pharmacological intervention
- Compact model of treatment will result in greater reduction of panic symptoms than pharmacological intervention
- Compact model of treatment will result in greater reduction of panic symptoms than psychotherapy alone
- The reduction of symptoms in pharmacotherapy treatment will be gradual
- The reduction of panic symptoms in psychotherapy treatment will be gradual
- The reduction of panic symptoms in combined treatment will be gradual
- Males and females differ in their response to therapeutic intervention
- Subjects falling in high and low age groups differ in their response to therapeutic interventions

MATERIALS AND METHODS

In September 2005, Dezfoul, Iran sample for the present study comprised of 60 adolescents suffering from panic symptoms 39 males, 21 females falling in age 12-19. The sample was drawn by means of purposive sampling. Those suffering with four or more of thirteen symptoms indicated as component of panic attacks in DSM-IV classification were included in sample. The sample was divided into four groups in terms of nature of intervention as follows: Group 1: Subjects given pharmacotherapy intervention; Group 2: Subjects given psychotherapeutic intervention; Group 3: Subjects given both the above interventions, compact model; Group 4: Subjects given no intervention (control group). Since the present study was in Dezfoul-Iran, the sample was drawn from various schools of the city. Four schools, identification of subjects was done with the help of screening on the basis of DSM IV questionnaire. Out of the subjects screened, (60) subjects volunteered to take part in this investigation for a period of 12 weeks. Each group consisted of 14 to 16 patients. Subjects were assigned to one of the four groups. Intervention program for all groups began at the same time. The fourth group remained without any intervention and wait for benefit of research results for there treatment .

Panic symptoms questionnaire: The questionnaire consists of 13 items, in accordance with the DSM IV classification of panic symptoms. The questionnaire measures the presence of symptoms as well as severity. There are two response categories of measuring severity, (1) never or rarely experienced, (2) often experienced. A total panic symptom severity index was calculated by summing the responses to these 13 items. Since this questionnaire was the first questionnaire which subjects were given, certain biographical and other questions were also asked by the researcher to elicit relevant information. This comprised part I of questionnaire and included information relating to age, gender, grade, presence of psychological and organic illness and drugs taken.

Patient report questionnaire: The patient report questionnaire was used to evaluate the status of the subjects on the 13 symptoms while undergoing treatment. Against each symptom, columns were given in which on a daily basis, subjects could report whether they experienced symptom or not. Subjects made noting every day of the week. These weekly measurements were made for all subjects throughout twelve sessions of treatments. Again, responses were measured on two response categories. Each week, subject's evaluation formed part of the interaction with the researcher.

Procedure: First, the researcher identified a sample of students who had experienced 4 or more panic symptoms and who were willing to take part on this study. Using a minimum of 4 symptoms as a cut off point for including subjects in sample was made in view of the fact that 4 symptoms are criterion for panic disorder but PD also includes panic attacks. However, since study of panic attacks was not the concern, other conditions like occurrence of these attacks within 10 min etc, were not considered. Present purpose is merely to draw out a relatively vulnerable sample. Therefore, a questionnaire-containing list of symptoms and columns for relevant biographical data was administered to adolescent students (12-19 years) belonging to four schools selected random sampling (Iran-Dezfoul). On the basis of the symptoms noted and interview conducted, students were identified to take part in the research program. Since the intervention which researcher had planned involved pharmacological as well as psychotherapeutic interventions, it was important that prospective subjects should be made fully aware of procedures. Ethical considerations are an integral part in all research, most particularly social science research because It has been dealing with human subjects. Therefore informed consent of participants was obtained. Subjects were divided into four groups, each involving different type of intervention.

First group: Group given pharmacotherapy consisted of 14 subjects. Since their intervention was related to drugs, each subject was given detailed instructions with regard to drug administration. In these study benzodiazepines, try-cyclic antidepressants and selective serotonin reuptake inhibitors were given, as recommended by psychiatrist. Due care was taken to ensure that drugs already being taken and major symptoms experienced (as indicated in panic symptom questionnaire filled by subject) were taken into account while deciding drug and dosage. This slight drug variation may be considered by some to be a weakness in design, but since it was professionally ensured that drug dosage would be within similar limits of effects created on symptom, there would not be any major problem of design. Ethical consideration of welfare of patient needed to be kept supreme. The subjects filled the patient report questionnaire and every week their position was assessed by the researcher. The intervention covered a period of 12 weeks; therefore twelve weekly self-assessments (i.e., 3 monthly self-assessments) become available. The group undergoing psychotherapy.

Group two: On group number 2, 16 Ss were given certain instructions and training which would enable them to follow the program of cognitive-behavior therapy.

Three important aspects were (a) cognitive restructuring, The basic approach adopted in cognitive restructuring program conducted by researcher was providing Ss with non-catastrophic corrected information of the nature of panic symptom. The cognitive restructuring started during the first session with discussion between researcher and subjects regarding symptoms being experienced. Questions regarding cues (person or situation) which elicited the symptoms were asked. This helped the researcher to get baseline information regarding the nature and genesis of symptoms. This process was followed up during the weekly sessions with the researcher (Oei *et al.*, 1999) (b) Relaxation program (Murphy *et al.*, 1998) and (c) diaphragmatic regulation. This is done by: Learning to switch from upper-chest to diaphragmatic breathing, practicing slower, deeper breathing, increasing breath volume by practicing with a volumetric exerciser. Subject was given active demonstration and guided in learning all exercises. Further he/she was told to practice neutralizing anxiety-producing thoughts. This was important because it is essential that control should include cognitive control. Once control has been gained, staying in control becomes the focus. This takes some further awareness and practice. The first step is to make relaxed, diaphragmatic breathing a part of everyday life. Keeping reminders during the day to breathe, using the diaphragm, turning to diaphragmatic breathing under stress conditions, taking breathing with talking and moving. Think to relax using diaphragmatic breathing and relaxation (Schmidt *et al.*, 2000).

Group three: On group number 3, 14 Ss were given both pharmacotherapy and psychotherapy. Therefore subjects were advised drug regimen which they followed (just like group 1) and also had to undertake psychotherapeutic intervention (like group 2) for twelve weeks.

Forth group: No treatment was given on fourths group by 16 Ss. They were however asked to record their symptoms on a daily basis and discuss their weekly status with the researcher. The status of symptoms (incidence as well as intensity) experienced by no treatment group would enable the researcher to check whether improvement was a matter of passage of time. Thus all the four groups kept a daily record of symptoms and 12 weekly sessions spread over 3 months (12 session in all) were conducted in which Ss visited the clinic and the researcher had opportunity to observe and discuss status with them. The findings obtained from Ss daily assessment which were discussed each week and were analyzed through appropriate statistical tests.

Data analysis: The researcher, keeping in view the nature of study used following non parametric statistical methods. Wilcoxon Signed Rank Test, Kruskal-Wallis One way analysis, Friedman ANOVA Test (F_r), Wilcoxon Mann Whitney U. Analysis were conducted with the help of SPSS 11.5 computer software.

RESULTS

Results of all analysis have been reported and elaborated as follows:

Since an important methodological concern for the researcher was to ensure that all four groups are statistically similar in terms of number of panic symptoms before the sessions of treatment start, Kruskal-Wallis test was applied across all four groups.

Results reported in the Table 1 show that the four groups of subjects do not differ significantly at this point in terms of number of panic symptoms experienced by them. This is important, since it will enable the researcher to make inter-group comparisons after administration of treatment.

After this, treatment sessions were started and groups were treated for panic symptoms using specific methods. The first hypothesis formulated by the researcher was concerned with testing whether the number of symptoms recorded after administration of treatment were significantly lower than recorded prior to treatment. Analysis using Wilcoxon Signed Rank Test was done simultaneously for subjects assigned to the three methods.

Results reported in Table 2 show significant differences in the number of panic symptoms observed at beginning of the sessions and end of all sessions. This result indicates an overall improvement in terms of number of symptoms of all subjects who have been given interventions. Thus hypothesis 1 is supported by present findings.

High number of subjects is without any symptom or very low number of panic symptoms. There are no subjects who have high number of panic symptoms.

Table 1: Differences of treatments before start (n = 44)

Treatment methods	N	Mean rank	Kruskal Wallis (H)	p-value
Pharmacological	14	28.89	1.563	0.668
Psychological	16	26.88		
Combined	14	33.75		
No Treatment	16	32.69		

Table 2: Differences at the beginning and end of the treatment (N = 44)

Ranks	N	Mean rank	Sum of ranks	Z-value	p-value
Negative ranks	41	21.00	861.00	-5.58	<0.001
Positive ranks	0	0.00	0.00		
Ties	0				
Total	41				

The above analysis has taken all the intervention groups as one group and compared it with control group. For a clearer understanding of these findings, hypotheses relating to each particular treatment method had been formulated.

Hypothesis No. 2 stated that the number of panic symptoms will become significantly less after pharmacological treatment. Therefore, data for group which underwent pharmacological treatment was analyzed separately.

The Table 3 indicates a significant decrease in the number of panic symptoms at after sessions position in comparison to the before sessions condition. Thus Hypothesis 2 is supported by present results.

Hypothesis 3 was concerned with comparison of panic symptoms before and after psychotherapy. It stated that there would be decrease in symptoms after psychotherapy.

The Table 4 indicates that there is a significant decrease in number of panic symptoms after psychotherapeutic intervention. Hypothesis 3 is therefore supported by present results.

The next Hypothesis viz. Hypothesis 4 states that the number of panic symptoms will become significantly less after administration of compact model of treatment.

Table 5 indicates that there is significant effect of combined therapy method on the occurrence of panic symptoms in the sense that therapy causes the decrease of panic symptoms. Thus, Hypothesis 4 is supported by present results.

It is clear from the results that different therapies are effective in alleviating panic symptoms. However, we are still not sure whether this happens only in the presence of a therapy, or even without any intervention, improvement takes place in course of time. Therefore, the data of those subjects who were not given any kind of therapy was also analyzed. Results obtained after analysis of this controlled group have been reported in Table 6. The hypothesis formulated in this regard stated that there will be no reduction in number of panic symptoms in subjects to whom no intervention was given.

Results in Table 6 indicate that there was no change in the number of panic symptoms when the subjects were not given any therapy. Hypothesis 5 is also satisfied by present findings. Thus, whereas each of the three therapeutic interventions are effective in dealing with panic symptoms, the control condition of no treatment has no effect on panic symptoms.

Table 3: Differences in the beginning and end of the treatment through pharmacotherapy (n = 14)

Ranks	N	Mean rank	Sum of ranks	Z-value	p-value
Negative ranks	13	7.00	91.00		
Positive ranks	0	0.00	0.00	-3.186	0.001
Ties	0				
Total	13				

Table 4: Differences at the beginning and end of the treatment through psychotherapy (n = 16)

Ranks	N	Mean rank	Sum of ranks	Z-value	p-value
Negative ranks	15	8.00	120.00		
Positive ranks	0	0.00	0.00	-3.149	0.001
Ties	0				
Total	15				

Table 5: Differences in the beginning and end of the treatment through compact model (n = 14)

Ranks	N	Mean rank	Sum of ranks	Z-value	p-value
Negative ranks	13	7.00	91.00		
Positive ranks	0	0.00	0.00	-3.184	0.001
Ties	0				
Total	13				

Table 6: Differences in the beginning and end of subjects with no treatment (n = 16)

Ranks	N	Mean rank	Sum of ranks	Z-value	p-value
Negative ranks	5	8.20	41.00		
Positive ranks	9	7.11	64.00	-0.732	0.464
Ties	2				
Total	16				

Table 7: Symptoms under different therapeutic conditions (n = 44)

Therapies	N	Mean rank	Kruskal Wallis H	p-value
Pharmacotherapy	14	22.46	9.408	0.009
Psychotherapy	16	26.60		
Combined therapy	14	13.08		

To find the answer to this question we need to compare final record of number of panic symptoms of the three therapeutic techniques simultaneously. For this purpose Kruskal-Wallis test is most suitable.

Response to the therapies was assessed by comparing mean ranks of number of symptoms recorded. Low value of mean rank for a therapy denotes the presence of low number of symptoms therefore high effectiveness of that therapeutic method.

An observation of the Table 7 indicates that combined method is the most effective treatment method followed by pharmacotherapy and psychotherapy, respectively. Overall picture shows that all three methods of treatment are useful in the treatment of panic disorder but they differ significantly from each other in terms of their effectiveness.

Although each specific method is effective, Hypothesis 6 has been formulated to state that psychotherapy will result in greater reduction of panic symptoms than pharmacotherapy. The relative advantage of psychotherapy has been hypothesized on the basis of

Table 8: Differences between pharmacotherapy and psychotherapy after therapies

Groups	N	Mean rank	Sum of ranks	Mann-Whitney U	p-value
Pharmacological	14	12.46	162.00		
Psychological	16	16.27	244.00	71.000	0.218

Table 9: Difference between Pharmacotherapy and combined therapies

Groups	N	Mean rank	Sum of ranks	Mann-Whitney U	p-value
Pharmacotherapy	14	17.00	221.00	39.00	0.016
Combined	14	10.00	130.00		

the fact that it has no negative side effects like pharmacological intervention and has greater long-term effects.

It is clear from the Table 8 that there is no significant difference between psychotherapy and pharmacotherapy in terms of their efficacy. Hypothesis 6 is thus rejected by present findings.

Hypothesis 7 suggests that compact model will be more effective than pharmacological intervention.

There is significant difference between pharmacotherapy and compact model of therapy in terms of their efficacy to reduce panic symptoms. Combined method is significantly more effective than pharmacotherapy (Table 9). Hypothesis 7 is thus supported by results.

The compact model was also compared to psychotherapy.

There is significant difference between psychotherapy and compact model of therapy in terms of their efficacy to reduce panic symptom. Compact method is comparatively more effective than psychotherapy (Table 10). Hypothesis 8 therefore stands ratified.

An interesting and important question is related to the manner in which improvement takes place, whether it is abrupt or whether it is gradual. In order to analyze this pattern across all three therapies, data for each treatment condition were recorded on a monthly basis and compared with the help of Friedman's ANOVA.

Mean ranks in Table 11 indicate a gradual reduction in the number of panic symptoms as pharmacotherapy progresses. Furthermore, all three records of number of panic symptoms differ significantly. This shows that the magnitude of change in the number of panic symptoms from first month to second month and second to third, indicating that they are gradually coming down.

Hypothesis 9 which states that there is gradual reduction of symptoms in pharmacotherapy group is thus supported by results.

Table 10: Differences between psychotherapy and combined therapies

Groups	N	Mean rank	Sum of ranks	Mann-Whitney U	p-value
Psychotherapy	16	18.33	275.00	40.00	0.007
Combined	14	10.08	131.00		

Table 11: Symptoms through Pharmacotherapy (n = 14)

	Mean rank	F _r -value	p-value
Month 1	3.00		
Month 2	1.65	24.571	<0.001
Month 3	1.14		

Table 12: Symptoms through Pharmacotherapy (n = 16)

	Mean rank	F _r -value	p-value
Month 1	3.00		
Month 2	1.65	24.571	<0.001
Month 3	1.14		

Table 13: Symptoms through Compact therapy (n = 14)

	Mean rank	F _r -value	p-value
Month 1	2.93		
Month 2	2.07	26.143	<0.001

Table 14: Symptoms through intervals of Control Group (n = 16)

	Mean rank	F _r -value	p-value
Month 1	1.94		
Month 2	1.97	0.237	0.888
Month 3	2.09		

In a similar manner analysis of symptoms in psychotherapy group and compact model group was undertaken.

On perusal of Table 12, it may be concluded that hypothesis 10, which suggests that subjects undergoing psychotherapy will show a gradual reduction in panic symptoms is supported by results.

Again, it can be seen from the Table 13 that alleviation of symptoms in the compact treatment group is also gradual. This supports Hypothesis 11. Thus, it may be concluded that all three therapeutic methods manage the problem of panic attacks gradually.

As expected there is no reduction in number of panic symptoms observed at one-month intervals in no-treatment group. This shows that the symptoms of panic attacks persist in the absence of treatment. Further observation of mean ranks indicate slight increase in the number of symptoms in the third month Table 14.

Once we are assured that therapies chosen in present research are effective to deal with panic symptoms, the question arises whether both gender groups respond favourably, or is favourable outcome limited to one group only.

Results reported in Table 15 indicate that therapies are working effectively for both male subjects as well as female subjects. Thus hypothesis No. 12 which states that males and females are likely to differ in their response to therapeutic intervention is rejected.

Table 15: The Impact of therapies on male and female subjects

Gender	Ranks	N	Mean rank	Sum of ranks	Z-value	p-value
Males (n = 30)	Negative Ranks	28	14.50	406.00	-4.627	<0.001
	Positive Ranks	0	0.00	0.00		
	Ties	0				
	Total	28				
Females (n = 14)	Negative Ranks	13	7.00	91.00	-3.184	0.001
	Positive Ranks	0	0.00	.00		
	Ties	0				
	Total	13				

To see if some particular therapy is more or less effective in the two gender groups, it would throw more light on the matter, each of the three therapeutic models administered. That is, panic symptoms have been significantly reduced by each therapy in both males and females. No difference therefore exists in therapy situation as a whole. (1) Pharmacotherapy: Males-(N = 8) Mean rank = 4, sum of ranks = 28.00, Z = -2.375, p = 0.018 Females (N = 6), sum of ranks = 21.00, Z = -2.201, p = 0.028. (2) Combined model: Male N = 8, Mean rank = 4.50, sum of ranks = 36.00, Z = -2.530, p 0.011, Female = 5 Mean rank = 3.0, sum of ranks = 15.00, Z = -2.032, p = 0.042). (3) Only in psychotherapy conditions, we find males responding to it, (Male N = 13, mean rank = 7.00, sum of ranks = 91.00, Z = -3.190, p = 0.001) but in females there was no significant reduction of symptoms after psychotherapy (z = -1.342, p = 0.180).

Age is another important factor which may influence the outcome of therapies. The researcher had hypothesized that subjects of high and low age groups are likely to differ in their response to therapeutic interventions. In order to find an answer to this query, age based groups of subjects were formed. Age of subject was broken into quartiles. Subjects who represented the first quartile were termed as low age group and subjects who represented the fourth quartile were termed as high age group. Both the groups were tested on Wilcoxon Signed Rank Test to compare their performance before and after therapy sessions.

Table 16 clearly indicates that subjects of both age groups respond well to therapies, that is their panic symptoms are reduced after therapeutic intervention.

Although, a close comparison of mean ranks and z values of both groups reveals that subjects falling in the low age group respond to the therapies slightly more positively than the subjects of high age group, any conclusion of difference is unwarranted. Thus hypothesis 13 stands rejected.

Here, we observe that the two age groups respond slightly differently to each specific therapy condition. Symptoms of high age group are reduced effectively by compact treatment model (Low age, z = -1.633, p.102. high age = -2.023, p = 0.042), but not so effectively by

Table 16: The Impact of therapies on the subjects representing the two age groups

Age Groups	Ranks	N	Mean rank	Sum of ranks	Z-value	p-value
Low (n=18)	Negative Ranks	15	8.00	120.00	-3.415	0.001
	Positive Ranks	0	0.00	0.00		
	Ties	0				
	Total	15				
High (n=12)	Negative Ranks	12	6.50	78.00	- 3.061	0.002
	Positive Ranks	0	0.00	0.00		
	Ties	0				
	Total	12				

pharmacotherapy and psychotherapy (Pharmacotherapy = low age, Z = -2.524, p = 0.012 High age, Z = -1.604, p = 0.109, psychotherapy, low age, Z = -1.41, p = 0.066 high age, Z = -1.343, p = 0.180). On the other hand, panic symptoms of low age group are effectively reduced by pharmacotherapy only. The number of subjects falling in each treatment condition is small, so no conclusion should be drawn, but the trend indicated may be a fertile topic for further research.

DISCUSSION

The present research was an attempt to assess the comparative efficacy of pharmacotherapy, psychotherapy and a combination of pharmacotherapy and psychotherapy for treatment of panic symptoms amongst Iranian students. These three therapies were conducted with three separate groups of patients and were compared with a control group which did not receive any therapy during the period of time when other three groups received therapies. A single therapist delivered all treatments. This was done to minimize variance across the study groups.

The first step was to test whether the four groups of subjects were equivalent on panic symptoms before the therapies began. Results of this analysis revealed that all the four groups were statistically equivalent in terms of number of panic symptoms reported. Groups had also been equalized in terms of other pertinent variables. Thus the only factor which varied across study groups was the mode of treatment given to the subjects. Prior researchers have attempted to identify the most suitable therapeutic technique which is capable of managing the problem of panic attacks most effectively with other samples. While commenting on the efficacy of behavioural therapies, Clark (1986) stated that these techniques which are based upon conditioning are effective with maladaptive beliefs and modify them directly. In contrast, pharmacological therapy is based on the assumption that panic disorder arises from disturbances in the neurobiological systems. Therefore, the aim of pharmacotherapy is to regulate the functioning of neurotransmitters (Mavissakalian and

Perel, 2002; Kirsch and Sapirstein, 1998). As far as combination of pharmacotherapy and psychotherapy is concerned there are conflicting views. However, overall observations on combined method proves that it yields greatest benefit (Barlow *et al.*, 2000).

Results of present research provide a comparative profile of different methods used. Primarily, each therapy was found effective in minimizing the panic symptoms to a significant level. This assures us that therapies suggested by various practitioners and researchers who represent different viewpoints are effectively functioning with the sample of Iranian students. This becomes more clear and evident when we see that patients who did not get any treatment, did not get any respite from their problems. This shows that reduction in panic symptoms is not an automatic or circumstantial phenomenon, rather it is the consequence of intervention. This fact is further strengthened by the finding that each therapy causes a gradual reduction in the appearance of panic symptoms and the improvement does not happen at once. Remarkably, such a change was not recorded in the control group during the period when other groups were undergoing therapy sessions.

Since all therapies were found effective to deal with the problem, the researcher was interested to find out which one of them is most effective. Present analysis revealed that combined method of treatment was most effective to deal with the problem of panic attacks amongst Iranian students. Pharmacotherapy was next, followed by psychotherapy. This finding supports the study done by Sharp, Power and Swanson. Present analysis reveals that psychotherapy is somewhat less effective in comparison to pharmacotherapy. This can be explained by the fact that drugs influence the neurochemical systems, so individual is influenced by the drug directly. In case of psychotherapy a therapist looks for his options of cure through relearning/reconditioning, adaptability of the patient and cognitive restructuring. An interesting observation in the study was that the advantages of pharmacotherapy have sharp ups and downs. Symptoms decrease abruptly and increase abruptly, although by the end of the sessions very significant reduction in symptoms is observed. It is an open question as to what the status of symptoms would be had the study continued for another two months. Another factor should also be kept in mind. Sudden increase and decrease in symptoms may adversely affect the sense of well-being of subjects. This is an aspect which needs to be focused on. Although interaction with subjects took place every week and a general understanding of well-being was forthcoming, yet as a specified objective it would have been studied more

methodically. This is something which should be done. With well-being as an additional parameter of effectiveness, it is likely that psychotherapy would emerge superior to pharmacotherapy. However, as things stand, pharmacotherapy was found superior to psychotherapy and compact model of therapy in which both drugs and behavioral techniques are used was found the most effective.

After studying the efficacy of various treatment methods in reducing panic symptoms we explored their impact on symptom-reduction in various age and gender groups. In this connection present analysis with all participants showed that patients of high age group as well as of low age group responded to therapeutic intervention. Taking up each therapy separately, we find that pharmacotherapy was effective for patients of low age group whereas it was not found effective for patients of high age group. It is likely that adolescents in the lower age group could not effectively participate in CBT, as a major onus of responsibility of carrying out relaxation, diaphragmatic breathing and cognitive restructuring falls on the patient. Pharmacological treatment was externally delivered, so they could respond to it. Some psychotherapeutic intervention suitable for adolescents needs to be contemplated. Weisz *et al.* (2002) have opined that interventions used for adolescents are adaptations of treatments suitable for adults or children and outcome research reveals several gaps. For the later teens, adult treatments may be effective, but for the early adolescent they may not be very appropriate.

Thus for the younger age group (12-15 years) CBT may not have been properly identified with. Some other activities need to be added to help in effective conduct of CBT. Therefore, if audiovisual films, depicting potentially panic-arousing cues and situations are shown with neutral or favorable outcomes, it is likely to aid the process of psychotherapy. Cognitive restructuring would be immensely aided by this. The interest and motivation of the subject would be greatly enhanced.

The fact that age is influential on the efficacy of therapeutic modalities has also been observed by Wolfgang *et al.* (2007), who have commented on the role and effectiveness of a therapist for patients of different ages. Since a therapist plays a vital role in the effectiveness of a therapy, particularly psychotherapy, therapies are influenced by the subjective relationship between the therapist and patient. Therefore, the difference may be reflective of this fact. Although dysfunctional attitudes may be hypothesized to be trait-like marker of various disorders, but they are influenced by state-dependent affects which change considerably with experience and learning. This is a cognitive issue

which gets strengthened with age. Lower age group therefore does not respond to CBT, but responds to pharmacotherapy. The higher age group gives a good response when both pharmacotherapy and psychotherapy is administered, but does not respond to pharmacotherapy alone and psychotherapy alone. Thus the upper age group, which is comparatively older (although it is below 19 years) is able to draw benefits from psychotherapy although pharmacotherapeutic help is also required. But pharmacotherapy without psychotherapy is not effective. For younger age group, only pharmacotherapy was effective. Again, number of subjects is not very large (which is bound to be the case in clinical research of this nature) so conclusions need to be drawn with caution.

It has been observed very minor trend of gender differences amongst patient in responsiveness to therapies. Males and females respond equally well to therapy. But when specific therapy situations were compared, it was found that males respond to psychotherapy, but in females, there is no significant reduction of panic symptom after psychotherapy. In the other two interventions, the response of the two groups was similar. In this connection Cole (1990) theories by integrating psychological and socio-cultural determinants within a unified conceptual structure. Gender roles and conceptions are the product of a broad network of social influences operating interdependently in a variety of social subsystems. People of different gender being biologically different and also being influenced by a social system which defines and structures gender identities, so they are also likely to respond differentially to intervention.

An overall trend (through statistically not significant) of rather low responsiveness of female patients across three modalities is observed in the sample. Although studies comparing gender groups in terms of their response to therapy for panic disorders are not available, it has been reported that the incidence of panic disorder is higher amongst females than males. It is possible that thus comparatively low responsiveness is a reflection of their greater propensity and vulnerability for the disorder. However, this is an area for further study, the present results merely indicates a direction.

Performance of combined method, overall as well analyzed for age and sex was more effective than other two methods. This is an important result in the sense that theoretical assumptions of both pharmacotherapy and psychotherapy represent different viewpoints. Researchers further suggest that there are distinctions between short-term and long-term effects of combined method (Westra and Stewart, 1998). According to Marks and Dar (2000) long-term effects of a negative nature are

associated with combined method because learning process during behavioral interventions might be influenced by medication and medication influences aspects of attribution, self-efficacy and safety behavior.

The advantage of combined method lies in the fact that it is able to create responses at the physiological level and also mobilize the cognitive resources of the individual. Thus individuals with predominant body symptoms respond readily and manifest a quick improvement. The psychotherapeutic method, also contributes in a gradual, steady manner to alleviate the problem. However, if the advantage is short term and long-term effects of a negative nature accrue because medication influences of pharmacotherapy detract from long term advantages of psychotherapy, then even the compact method needs to be re-assessed. Quick relief has its advantages, because patient who is suffering severely develops a favorable attitude towards therapy if he experiences relief. The decision of including pharmacotherapy in the regimen should perhaps be based on the severity of symptoms. The period for which pharmacotherapy is administered should be monitored and minimized.

Therefore it may be concluded that although compact model is most effective in terms of reducing panic symptoms, more research, particularly of a longitudinal nature needs to be undertaken to understand its advantages and disadvantages. The same applies to pharmacotherapy and psychotherapy, so that the three treatment models can be placed in their proper perspectives. When treatment is administered, the goal is to achieve relief, not for a limited period but at least for an extended period of time, if not permanently. Thus, persons who have been treated should be assessed in follow up studies. To what extent the advantages of treatment are retained, that is whether the status achieved when pronounced treated continues or there is some deterioration. If there is deterioration, does it continue over time or does it stop at some point to show that a particular level of advantage is retained. The question becomes even more pertinent with possibilities of long-term negative outcomes of pharmacotherapy being suggested by some researches. All therapeutic models should be assessed for long term advantage and disadvantage.

A second important aspect which needs to be considered is sense of well-being. In a study, which investigated impact of drug therapy and meditation on hypertension, it was demonstrated that through drug therapy and meditation were equally effective in reducing hypertension, sense of well being was significantly higher in subjects undergoing meditation (Meuret, 2003; Abelson *et al.*, 2001). This was attributed to the negative side effects of drug therapy. The same could be the case

with pharmacotherapy and psychotherapy. If sense of well being is associated to a higher degree with one more than the other, it would be a distinct advantage for the intervention because the subjective experience of well being is an important therapeutic goal. Future studies may take this into account.

It is also important that therapy package appropriate for different age groups should be designed. For the adolescent, existing therapies are a downward or upward adaptation of adult and child therapies. Undoubtedly, therapists through their sensitivity and intuition devise strategies appropriate for the patient, but if experiences in this regard are integrated and take the form of something concrete, it would be something extremely useful. Thus studies which would elicit and integrate information in this regard from therapists can be undertaken.

Last and most important, in the light of increasing incidence of PD, other anxiety disorders and depression, the importance of apprehending them before they become full blown pathology should not be under estimated. The sample in the present study was students going to school without any formal diagnosis of PD. Most adolescents have problems and particularly in a country like Iran which has uncertainty on the educational front, so important for young students, the problems will be more pronounced. Identifying students with vulnerabilities is extremely important. Therefore screening through appropriate tests is advised to be conducted in schools, particularly for those who manifest behaviors reflecting depression, unhappiness, tension, behavior problem or those who absent themselves frequently due to illness.

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