Efficacy of Cognitive-Behavioral Group Therapy Versus Group Hypnotherapy on Brain/Behavioral Systems of Social Phobia Patients

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Article Info

ABSTRACT

Background & Objective: Social anxiety disorder, which involves excessive anxiety of social situation due to fear of negative evaluation, is a debilitating disorder that leads to social dysfunction. The purpose of this study is to investigate Efficacy of Cognitive-Behavioral Group Therapy (CBGT) versus Group Hypnotherapy (GHT) on Brain/Behavioral Systems of Social Phobia Patients.

Materials & Methods: Thirty subjects were included in this study and divided into two groups receiving either CBGT or GHT. The questionnaires of brain/behavioral systems (GWPQ) and social phobia (SPIN) were administered in two phases (before and after intervention).

Results: Both therapy approaches caused significant changes in the level of social phobia and brain/behavioral systems activity. The alterations in brain-behavioral subsystems (BIS and FFFS) in the Extinction and Flight components were in favor of hypnotherapy (P<0.05).

Conclusion: The findings from the present research provide evidence that altering brain/behavioral systems associated with the social phobia hypnotherapy can be considered as a powerful approach treating social phobia.

Keywords: Social phobia, Brain/behavioral systems, BIS, FFFS, Cognitive-behavioral therapy, Hypnotherapy

Introduction

The social anxiety is regarded to have the second and the third ranks in being the most ordinary anxiety malfunction and mental malfunction respectively (1).

As it is defined in DSM 5, Social Anxiety (which is referred to as Social Phobia) constitutes a consistent phobia in regard to diverse situational contexts and their relevant performances which might embarrass or humiliate the individual. Although the individuals acknowledge that the fear is unreasonable or excessive, yet exposure to the feared situation can cause physiological symptoms, avoidance and as a result a major dysfunction in social and occupational activities (2).

The prevalence estimation indicates that approximately 7–13% of the Western societies’ population meets diagnostic criteria for the social phobia at some point during their lifetime (3).

There are various pathways associated with the acquisition and maintenance of SAD such as genetic and temperamental influences, environmental factors (e.g. parental factors, peer influences, conditioning or learning experiences) and cognitive styles and biases (4-6). The inhibition which affects behavior and personality is linked to social anxiety in a strong way. The behavioral inhibition is a tendency which is marked by the restriction of behavior, a low level of approach-oriented acts, escalated vigilance, and intensified reaction to strange conditions (7). Gary’s theory of personality treats the inhibition of behavior as one of the main aspects of personality and refers to it as the reinforcement sensitivity theory (RST) (8,9). RST suggest three major subsystems in brain which underlies many of the personality’s individual differences; psychopathology, reinforcement sensitivity and motivated behavior (10,11). The aforementioned systems in brain constitute the Fight-Flight-Freeze System (FFFS), Behavioral Approach System (BAS), and Behavioral Inhibition System (BIS).

Brain/Behavioral Systems

Behavioral Approach System (BAS)

The BAS comprises a subsystem which is related to the appetite-oriented motivation in brain. This subsystem reacts to the conditioned and unconditioned stimuli by means of approach-related performance (10). The neural structure indicates BAS is the passage from mesolimbic
dopamine which rises from the ventral segmental part of brain to the striatum and the nucleus accumbens (11). Therefore, hypoactivity in the BAS has been assumed to cause depression whereas hyperactivity has been considered to mediate mania (11).

**Behavioral Inhibition System (BIS)**

The subsystem which controls defensive performance is the BIS. More specifically, it focuses on the priority of goals including the contrast between approaching and ignoring stimuli by means of the restriction of behavior, escalation of focus, arousal of feelings, and the evaluation of behaviors which involve certain risks (12). These risk assessment behaviors can be described as environmental scanning and memory scanning for the threat-relevant information (10). It seems that the BIS does not prefer the information which involves risks and avoids it (13). Since the major components of the BIS comprise medial hypothalamus, septo-hippocampal system, the periaqueductal gray, amygdala, prefrontal dorsal stream, and posterior cingulate (12), the BIS has claimed to determine anxiety due to the fact that it is the neural substrate which affects anxiety. The hyperactivity in it can lead to several malfunctions including the anxiety malfunction and nerve-cell-related depression (11,13).

**Fight–Flight–Freeze System (FFFS)**

The FFFS prompts the ignorance of all of the stimuli which are not preferable (10). Therefore, it has been known as the brain subsystem which defends the brain and avoids certain stimuli. Since the neural structure of the FFFS comprise the periaqueductal gray, amygdala, medial hypothalamus, prefrontal ventral stream, and anterior cingulate (12), it is supposed to be engaged with the emotions of fear and panic. Hyperactivity in the FFFS can demonstrate several anxiety disorders, including panic disorder and specific phobia (13).

Gray and McNaughton (2000) and Kimbrel (2008) argued that, the escalated sensitivity of BIS constitutes the foundation of Social Anxiety Disorder in terms of the neurobiology/personality. A large number of studies underscore this proposition (e.g., Coplan et al., 2006; Kashdan & Roberts, 2006; Kimbrel et al., 2008). Furthermore, a number of studies of imaging (e.g., Tillfors et al., 2001; Tillfors et al., 2002) have shown that regional cerebral blood flow increases in parts of the BIS for people who suffer from social anxiety disorder (4, 13-17). Further studies indicate that the sensitivity of fight-flight-freeze system (FFFS) had a positive relationship with social observation anxiety and social interaction anxiety (18). In other word, heightened FFFS is a key motivational factor underlying social anxiety as well as BIS (4).

There are several well-established treatments for the anxiety disorders such as behavioral therapy, cognitive-behavioral therapy, hypnosis and Pharmacological treatment (19-21). Similar to various familiarizing society-related experiences, the cures for the fear of social experiences which include supervised exposure to frightening society-related stimuli, like gradual exposure, systematic desensitization and, flooding are regarded to reduce the society-related anxiety and avoidance due to familiarization of social stimuli which take place in the BIS and FFFS circuits. Research shows that cognitive treatment decreases society-related anxiety by reducing the sensitivity of BIS and FFFS (15). On the other hand, recent conducted research by Halsband et al., showed that hypnosis can affect the left amygdala and bilaterally in the anterior cingulate cortex (ACC), insula and hippocampus by significant activation reduction of these areas, indicating that hypnosis can inhibit the reaction of the fear circuitry structures (22).

The purpose of this study was to compare the efficacy of short-term interventions in treating social phobia through different psychometric measures. Also, it is important to determine whether the changes in the brain-behavioral systems after treatment, differs from one therapy method to another or not.

**Materials and Methods**

**Participants**

The present study involved social anxiety patients, who took part in either CBGT or Hypnotherapy for the anxiety disorders at “Beheshti Psychiatry Hospital” during February 2016-August 2016. While 52 patients volunteered for the program, following diagnostic interview and further assessments only 37 started group-based treatments in the course of the study (i.e. two groups). From among these participants 34 participants finished the programs. Divided into two Groups, first group received 6 sessions of CBGT whereas the second group received 4 sessions of Group Hypnotherapy. Among the participants who finished the program, four were not included in the study because of lack of sufficient data. Most of the remaining 30 participants were female (i.e., 13 participants were male), age 18–36 (CBGT M = 26.2, SD = 4.93) (GHT M = 24.8, SD = 3.41). Treatment completers in both groups did not differ by age, education, sex, ethnic background, frequency of the diagnoses of anxiety malfunction, or concurrent depressive malfunction.

**Procedures**

Patients were initially recruited to the study through posters and flyers in universities in Zanjan and also referred to the “Beheshti Psychiatry Hospital” from primary care clinic for the treatment of social anxiety malfunction. Diagnostic interview was utilized to examine the presence of the social anxiety criteria. The people with SAD were appointed and divided into two experimental groups (CBGT and GHT) randomly. While the First group received 6 therapy sessions of CBGT, the second group received 4 therapy sessions of hypnotherapy. The CBGT protocol was proposed by Morris, Mensink, Sherry driven largely from the treatment program developed by Heimberg (1991) and
Heimberg and Becker (2002) and the GHT protocol was instructed by the researcher with approval license and supervision through the study from the Iranian Scientific Society of Clinical Hypnosis. The participants were assessed in two stages of pre-test and post-test by following the questionnaires: social anxiety questionnaire and Gary Wilson’s personality questionnaire. All the study procedures were approved by IRCT (Iranian Registry of clinical trials, IRCT Code: IRCT2015121425523N1), Zanjan University of Medical Sciences (ZUMS Code: IR.ZUMS.REC.1395.36), ISSCH (Iranian Scientific Society of Clinical Hypnosis) and Human Research Protection Program.

Summary of the Cognitive-Behavior Group Therapy (CBGT) Sessions

Each week the CBGT group had a number of 2-h sessions. Two therapists worked together and led these sessions. Groups involved 7 to 9 patients. The main aspect of CBGT treatment involved psychological education, breathing-related training cognitive restructuring, simulated and internal experience of threatening stimuli, and training of society-related skills.

Session 1
1. Administering questionnaires
2. Introduction
3. Relate the members of group in terms of the symptoms and parallel phobic conditions
4. Overview of the coming sessions
5. Determining feared situations
6. Discussion of thoughts/situations on the board
7. Instruction in regard to the effect of thoughts on the successive physiological reactions and performances
8. Introduction of the Vertical Arrow Technique
9. Assigning homework

Session 2
1. Review homework
2. Introduction of the 10 Burns cognitive distortions
3. Administration of Feared Situations Questionnaire
4. Assigning homework

Session 3
1. Review homework
2. Create self-initiated thoughts and responses on the board
3. Instruction of the safety-oriented behaviors/cognitions with a number of examples furnished by the therapist
4. Homework

Session 4
1. Review homework
2. Introducing aspects of self-esteem

Sessions 5 and 6
1. Administering feared scenarios based on the responses from the Feared Situations Questionnaire.
2. Rating SUD (The Subjective Units of Distress) prior to commencing the role play, during and afterwards
3. Sharing feedbacks
4. Assigning exposure homework
5. Answering participants’ questions and solving their problems in exposure tasks

Summary of the Group Hypnotherapy (GHT) sessions

Session 1
1. Administration of PMR (Progressive Muscle Relaxation) and relaxation training
2. Homework: records of the session were given to participants for further practice as homework

Session 2
1. Recognition of primary symptoms
2. Imagery inductions
3. Homework: records of the sessions 1 and 2 will be given to the participants for further practice

Session 3
1. Emotional modeling
2. Cognitive reconstruction
3. Behavior modification through mental visualization
4. Conditioning
5. Homework: records of the sessions 1, 2 and 3 will be given to the participants for further practice

Session 4
1. Repetition of the conditioning
2. Repetition of the 3rd session
3. Answering the participants’ questions
4. Asking them for feedback

Measures
ADIS-IV motivated Diagnostic interview (anxiety malfunction interview utilized for DSM-IV)

Anxiety malfunctions interview for DSM-IV constitutes a systematic interview used for evaluating the present states of anxiety malfunctions. The interview helps to establish a differentiating diagnosis between anxiety malfunctions by means of the criteria of DSM-IV. Moreover, ADIS-IV furnishes adequate information for the pragmatic analysis of anxiety malfunctions (19).
Social phobia Inventory (SPIN)

SPIN was first proposed by Connor et al. Based on the results of the clinical uses of this questionnaire, it is helpful in the determination of the symptoms of phobia, avoidance, and physiological features. It has satisfactory reliability and validity indices. The reliability of this questionnaire was assessed by means of retesting (the scores were 0.89 and 0.87) in groups suffering from social phobia. Its internal consistency coefficient (Ella factor) was 0.94 for normal individuals. Moreover, for fear, avoidance, and physiological discomfort, this coefficient was 0.89, 0.91, and 0.80 respectively. In regard to Iranian samples including the groups who had social phobia disorder, the reliability was assessed by means of retesting and ranged from 0.78 to 0.98. The alpha coefficient of this questionnaire comprises 120 items. Forty item subscales this coefficient was 0.89, 0.91, and 0.80 respectively. Moreover, for the phobia, avoidance, and physiological discomfort, this coefficient was 0.89, 0.91, and 0.80 respectively.

Gary-Wilson personality questionnaire (GWPQ)

This questionnaire assesses the level of activity of neurobehavioral systems along with their constituents. Wilson et al. (1989) developed GWPQ which comprises a self-assessment personality questionnaire. This questionnaire comprises 120 items. Forty items assess each one of the three systems including behavior activation system (BAS), behavior inhibition system (BIS), and flight-flight freeze systems (FFFS). Regarding BAS, 20 items evaluate the turned constituent and 20 items deal with the active avoidance constituent. In regard to BIS, 20 items focus on the potential active avoidance constituent and 20 items evaluate the silence constituent. Lastly, regarding the FFFS, 20 items examine the flight constituent and 20 items determine the flight constituent. Wilson et al., (1989) noted that the alpha coefficients ranged mostly from 0.6 to 0.7 and showed the satisfactory internal consistency of the questionnaire. As Azad Fallah et al. (2001) stated, the Cronbach’s alpha coefficients for the turned constituent, active avoidance constituent, potentially active avoidance constituent, silence constituent, flight constituent, and flight constituent were 0.68, 0.65, 0.78, 0.71, 0.69, and 0.78 respectively.

Results

Seven subjects were dropped out of the experiment due to the absence from therapy sessions and incomplete data. For data analysis, SPSS 21 (SPSS Inc. Chicago, Illinois, USA) was used. Kolmogrov-Smirnov and Levene tests were used for determining normal distribution of the data and the variance homogeneity, respectively. Since pre-assumption of variance homogeneity and normal distribution had been observed, the parametric tests were used. The results showed that there was no difference between experimental groups in terms of research variables, age and educational variables in pretest. The ANCOVA results related to the research variables are presented in Table 1. The results of comparing CBT and GHt results regarding the Extinction and Flight components are also expressed in Figure 1.

Table 1. Mean, Standard Deviation and post treatment ANCOVA results

<table>
<thead>
<tr>
<th>Variables</th>
<th>CBGT</th>
<th>GHt</th>
<th>F</th>
<th>p</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
<td>Pretest</td>
<td>Posttest</td>
<td></td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>SPIN</td>
<td>37.07</td>
<td>7.98</td>
<td>9.27</td>
<td>2.93</td>
<td>37.20</td>
</tr>
<tr>
<td>Approach</td>
<td>17.20</td>
<td>3.84</td>
<td>14.93</td>
<td>4.95</td>
<td>16.80</td>
</tr>
<tr>
<td>Active Avoidance</td>
<td>29.60</td>
<td>2.85</td>
<td>3.70</td>
<td>2.12</td>
<td>26.70</td>
</tr>
<tr>
<td>Passive Avoidance</td>
<td>13.33</td>
<td>2.69</td>
<td>8.53</td>
<td>4.50</td>
<td>13.60</td>
</tr>
<tr>
<td>Extinction</td>
<td>23.20</td>
<td>3.84</td>
<td>13.33</td>
<td>2.58</td>
<td>23.47</td>
</tr>
<tr>
<td>Fight</td>
<td>11.60</td>
<td>2.41</td>
<td>16.32</td>
<td>2.12</td>
<td>12.27</td>
</tr>
<tr>
<td>Flight</td>
<td>24.40</td>
<td>6.15</td>
<td>20.67</td>
<td>4.58</td>
<td>23.20</td>
</tr>
<tr>
<td>BAS</td>
<td>46.80</td>
<td>4.06</td>
<td>40.93</td>
<td>5.28</td>
<td>45.87</td>
</tr>
<tr>
<td>FFFS</td>
<td>36.53</td>
<td>5.42</td>
<td>21.87</td>
<td>6.12</td>
<td>36.93</td>
</tr>
</tbody>
</table>

*Significant at 0.05 level.
Figure 1. Comparison of CBT versus GHt results regarding Extinction and Flight components.

The results of this study indicated that an eight-week period of combined training (aerobic-resistance) are likely to affect some of the factors associated with prostate cancer which in turn may be able to contribute to the improvement of patients with prostate cancer (along with the main treatment protocol). We found that an eight-week period of combined training (aerobic-resistance) can significantly decrease the IGF-1 level in the training group. On the other hand, Tofighi et al. (2012) found that an eight-week period of resistance training can decrease IGF-1 level more than resistance and combined training (20).

Discussion

Previous studies have indicated that both Cognitive-Behavioral Therapy and exposure result in the adaptation to BIS and FFFS. This issue leads to a low level of social anxiety (13,24-26). The exposure was a key component in both of the interventions applied -as forms of in-vivo exposure in CBT and in-vitro exposure in hypnosis- in this study. The results highlighted the escalation of the reduction of the anxiety symptoms in the experimental groups and also changes in brain/behavioral systems which in some cases the hypnosis was more effective.

Conclusion

The aim of this study was to compare the short-term interventions in the treatment of social phobia and to observe the changes in brain/behavioral aspects of the disorder due to the differences between therapy approaches. Since hypnosis led to more significant changes in Extinction (BIS subsystem) and Flight (FFFS subsystem) as compared to the cognitive-behavioral therapy- which are two major components of the brain/behavioral systems involved in SAD-, it is recommended to consider hypnotherapy in treating general social phobia.

The results were found immediately after the completion of interventions and consisted of no follow-up. More comprehensive measures of BIS and FFFS would be useful for the field moving forward.

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References

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