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The Effects of Cognitive Behavioral Therapy Based on Hofmann's Model on Anxiety Sensitivity and Positive and Negative Affects Among Undergraduate Female Students with Social Anxiety Symptoms in Ahvaz Jundishapur University of Medical Sciences

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Abstract

Background: Social anxiety is the most prevalent psychiatric disorder in the student population and is known to affect many aspects of one's life. This disorder cannot be treated spontaneously without medical and educational interventions and may lead to more serious mental damages.
Objectives: The purpose of the current research was to study the effects of cognitive behavioral therapy (CBT) based on Hofmann's model on anxiety sensitivity and positive and negative affects among undergraduate female students with social anxiety symptoms in Ahvaz Jundishapur University of Medical Sciences.
Methods: The statistical population consisted of all female BA students of Ahvaz Jundishapur University of Medical Sciences. This study was conducted on 32 female students with symptoms of social anxiety, who were selected through simple random sampling among BA students. The participants were assigned into two groups: experimental and control (16 students per group). The research instruments included the social phobia inventory (SPIN), anxiety sensitivity index-revised (ASI-R), and positive and negative affect schedule (PANAS). Before starting the intervention, a pretest (using ASI-R and PANAS) was performed in each group. Then, the experimental group was exposed to Hofmann-based CBT intervention for 8 weekly sessions (90 minutes), whereas the control group received no intervention. The two questionnaires were administered again at the post-test stage.
Results: The results of covariance analysis showed that Hofmann-based CBT could decrease anxiety sensitivity and negative affect, while it increased positive affect among the participants.
Conclusions: CBT based on Hoffman's model is an effective treatment for reducing social anxiety; therefore, this method is recommended to psychologists and consultants.

Keywords: Cognitive Behavioral Therapy, Anxiety Sensitivity, Positive and Negative Affect, Social Anxiety

1. Background

Humans are social beings with a strong need to be liked, valued, and accepted by others. As a result, they fear the negative evaluation of their fellow humans about themselves. The clinical expression of this evolutionarily adaptive concern is social anxiety disorder (SAD) (1), which includes considerable fear of society and interpersonal situations, such as being observed by others, being in the presence of others, and conversing with others (2).

SAD is one of the most prevalent psychiatric disorders in the student population, which may lead to numerous complications in a person's life. Those with SAD have weaker social interactions and less adaptive capabilities, compared to their peers; they also may face more issues due to adolescence expectations (3). They are typically known as shy, risk averse individuals with defensive behaviors. This temperamental pattern may limit their encounter with risky conditions, such as joining substance-using peer groups or attending risky social events (4).

Some studies have shown that people with SAD suffer from higher levels of anxiety sensitivity (AS) and psychological arousal, compared to their normal peers (5, 6) and have more concerns about being observed by others, compared to others (5). In fact, AS leads to negative assessment, fear, common symptoms of anxiety, and severe reactions and increases the severity of anxiety symptoms (7); therefore, it can be addressed as a risk factor for anxiety problems.

Previous studies have shown that individuals with so-

cial anxiety see themselves as being socially inept or incompetent, probably more than non-anxious people (8, 9). Also, they view others as being critical evaluators who hold unreachable or overly rigid standards regarding social functioning (10-12); they continuously find themselves undesirable in every aspect (13, 14). Indeed, these individuals see a difference between their ability and self-worth and think they are partly responsible for every problem (15); hence, they more frequently experience negative affect (NA).

Mental health experts have proposed different methods for treating SAD. The most commonly utilized one is cognitive behavioural therapy (CBT), which has been widely used in recent years and its effect on reducing social anxiety and AS and improving PA and NA have been approved in some studies (16-22). Although CBT seems to be an effective method for treating social anxiety, further efforts should be made in this area. Therefore, a requirement for the progress of therapeutic measures is the transformation of theoretical models to better understand SAD and design specific manuals for this disorder.

In this regard, CBT intervention based on Hoffman's model is a comprehensive and specific model for SAD. It is introduced as a social self-reappraisal therapy (SSRT), in which special therapeutic techniques are used to correct the patients' conceptions about themselves in social situations. The results of primary studies on the effectiveness of this method have been quite promising (23).

Overall, SAD is a prevalent psychiatric disorder, which affects different aspects of life and leads to the squander of active and talented human resources, who cannot be useful for their society due to this disorder. With this background in mind, the present study aimed to examine the effects of CBT based on Hoffman's model on AS, PA, and NA of female students with social anxiety symptoms. In this study, we formulated three hypotheses:

Hypothesis 1: CBT based on Hoffman's model reduces AS among female students with social anxiety symptoms.

Hypothesis 2: CBT based on Hoffman's model increases PA among female students with social anxiety symptoms.

Hypothesis 3: CBT based on Hoffman's model reduces NA among female students with social anxiety symptoms.

2. Methods

This experimental study included pretest, posttest, and control groups.

2.1. Participants

The statistical population of this study included all female BA students of Ahvaz Jundishapur University, Ahvaz, Iran. In order to select the study sample, multiphase clustering and random sampling methods were applied. At first, 300 questionnaires were handed out among students of four faculties (nursing-midwifery, paramedical, rehabilitation, and healthcare faculties), using multiphase clustering method in order to identify students with social anxiety. In total, 113 out of 300 students obtained a score of 19 or higher. Finally, 83 students were interviewed through structured clinical interviews for DSM-IV Disorders (SCID).

Based on the results of the interview and the inclusion and exclusion criteria, 61 students were found to have SAD symptoms; the rest were excluded from the sampling process. Finally, 32 students with SAD symptoms were selected through simple random sampling (by lottery) and were randomly divided into two groups of 16 participants (experimental and control groups). After explaining the study methods and its conditions and receiving written informed consents from the participants, other study tools (PANAS and ASI-R) were applied.

After implementing the pretest, interventions were carried out in the experimental group collectively during 8 weekly sessions (90 minutes), whereas the control group received no intervention. After completing the intervention process, the posttest was carried out in both groups. As 3 absent sessions from the intervention was among the exclusion criteria, data belonging to 2 individuals from the experimental group and 1 individual from the control group were not included in the final analysis. Ultimately, the data belonging to 29 individuals from the experimental (n = 14) and control (n = 15) groups were statistically analyzed. A summary of the sessions is provided as follows:

2.2. Content of the Therapeutic Intervention

Session 1: Introduction, establishing the therapeutic relation, a brief explanation of SAD and its prevalence, proposing the intervention rationale, and home exercises.

Session 2: Reviewing home exercises of the previous week, reviewing the therapeutic pattern, social encounters in the session, and designating homework.

Sessions 3- 6: The structure of the third to sixth sessions were quite similar to that of the second session, ie, reviewing home exercises of the previous week, social encounters in the session, and designating home exercises.

Session 7: Designing real encounters with adversities outside the group, group discussions about these encounters, designating a session to show how to prevent the relapse of SAD, and an introduction during homework review.

Session 8: Gathering the group, discussing the learning materials, summarizing the progress of each group member, and stressing the independent function and learnt positive skills of every patient.

2.3. Instruments

2.3.1. Social Phobia Inventory (SPIN)

It is a self-rating tool which includes 17 items, consisting of three subscales of fear (6 items), avoidance (7 items), and physiological arousal (4 items). Every item of this questionnaire is scored according to a 5-point Likert scale: "not at all = 0, a little bit = 1, somewhat = 2, very much = 3, and extremely = 4". The reliability of this questionnaire, based on the test-retest method, in groups with SAD diagnosis ranged from 0.78 to 0.89, and its internal consistency (alpha coefficient) in a group of normal individuals was 0.94, and 0.89, 0.91, and 0.8 for the subscales of fear, avoidance, and physiological arousal, respectively (24).

The validity and reliability of SPIN were calculated for a non-clinical sample in Iran. The alpha coefficient of this questionnaire was 0.94 for the whole scale, and 0.94, 0.93, and 0.93 for the subscales of phobia, complaint, and avoidance, respectively (25). Also, in the current research, the reliability of the questionnaire was calculated using Cronbach's alpha (0.71).

2.3.2. Anxiety Sensitivity Index-Revised (ASI-R)

The early questionnaire of AS was designed by Reiss, Peterson, Gursky, and McNally and included 16 items and three subscales (26). Taylor and Cox provided the revised form of this tool, substituting its irrelevant, ambiguous, and unintelligible questions with more suitable ones, thus increasing the size of the questionnaire from 3 to 4 dimensions and its items from 16 to 36 (27). After examining the psychometric features of this tool in Iran, items 5, 11, 12, 25, 30, and 31 were excluded from the analysis due to their incongruity with the included factors (28). Hence, the short form of ASI-R including 30 items was used in the present study.

ASI-R includes 4 subscales, ie, fear of cardiac-vascular-gastric-intestinal symptoms, fear of respiratory symptoms, fear of publicly observable anxiety reactions, and fear of lack of cognitive control, scored respectively from 0 (very little) to 4 (very much), based on a Likert's scale. The reliability of this tool was calculated, based on internal consistency, test-retest, and split-half method, where validity coefficients of 0.93, 0.95, and 0.97 were calculated for the main scale, respectively (28). Also, in this study, reliability of the tool was calculated through Cronbach's alpha (0.89).

2.3.3. Positive and Negative Affect Schedule (PANAS)

This scale is a self-report tool of 20 items, designed to evaluate two temperament dimensions of PA and NA (29). Each subscale has 10 items, rated on a 5-point scale, "ranging from never (score 1) to very much (score 5). The range of scores for each subscale is 10 to 50. Reliability of the scale using inner compatibility coefficient method was reported to be 0.87 for NA and 0.88 for PA (30). Also, reliability of 8-week test-retest within different time tables was 0.68 for PA and 0.71 for NA.

Moreover, in terms of validity, the correlations between subscales with some tools measuring the structures related to these affects (such as anxiety and depression) were reported to be significant (29). The results of a study on 255 students with depression and anxiety disorders approved the two-factor structure of PA and NA inventory, and Cronbach's alpha coefficient was calculated to be 0.87 for both subscales (31). Also, in the present study, regarding the reliability of this tool, Cronbach's alpha was calculated to be 0.85 for PA and 0.90 for NA.

2.3.4. Structured Clinical Interview for DSM-IV Disorders (SCID)

SCID is a structured interview used to fulfill research and medical needs in the diagnosis of mental disorders of axis I and II in the diagnostic and statistical manual of mental disorders (DSM) (32). SCID-I is administrated in a single session and takes about 45 to 90 minutes to be completed. The reliability and feasibility of the Persian version of this diagnostic tool have been already determined as fair to good for most diagnostic categories (kappa > 0.6) (33). SCID-II was also compiled for diagnosing personality disorders. It contains 119 yes/no questions and takes about 45 to 90 minutes to be completed. The content validity of the Persian version has been approved by some psychological professors (34). Also, its reliability through test-retest with a 1-week interval was 0.87 (35). It should be noted that 2 versions of SCID were used in the present study.

3. Results

3.1. Descriptive Findings

Table 1 shows the mean and standard deviation of AS and PA/NA in the experimental and control groups in the pretest and posttest stages.

3.2. Examination of the Assumptions of Covariance Analysis

Prior to the analysis of data related to the hypotheses, the gathered information was examined to make sure that they fulfill the assumptions of covariance analysis. Levene's test was used to examine the homogeneity of variables' variance. The results of this test are presented in Table 2. These results show that the assumption of homogeneity of variances is confirmed.

Also, the assumption of homogeneity of regression slopes is a key factor in covariance. In this study, equality existed between covariate variables (AS and PA/NA

Table 1. Mean and Standard Deviation of AS and PA/NA

Variables	N	Pretest		Posttest	
		M	SD	M	SD
AS					
Experimental	14	31.64	11.05	19.42	8.58
Control	15	35.53	11.72	35.86	11.67
PA					
Experimental	14	28.21	4.57	34.21	4.97
Control	15	29.46	4.45	29.86	4.8
NA					
Experimental	14	29.42	8.45	23.07	8.13
Control	15	28.6	6.31	29.46	6.36

Table 2. Levene's Test of the Equality of Error Variances

Variables	F	df1	df2	Sig.
AS	0.024	1	27	0.87
PA	0.016	1	27	0.9
NA	2.12	1	27	0.16

pretests) and dependent variables (AS and PA/NA posttests) at all factor levels (experimental and control groups). Moreover, an insignificant relationship was observed between dependent and covariate variables. Therefore, the assumption of homogeneity of regression gradient was also approved. The results of this test are shown in Table 3.

Table 3. The Homogeneity of Regression Slopes

Source	F	Sig
Group × AS	0.54	0.58
Group × PA	0.23	0.79
Group × NA	0.79	0.46

3.3. Findings Related to the Study Hypotheses

Table 4 shows the results of multivariate analysis of covariance (MANCOVA) regarding posttest scores while controlling the pretest of dependent variables in the study (AS and PA/NA).

The content of Table 4 shows a significant difference between the experimental and control groups in terms of at least one dependent variable. One-way analysis of covariance in MANCOVA on dependent variables (AS and PA/NA) was performed to examine the point of difference. The results of this analysis are shown in Table 4.

Table 5 shows that one-way analysis of covariance for AS (F = 35.11 and P = 0.0001), PA (F = 65.08 and P = 0.0001), and NA variables (F = 50.16 and P = 0.0001) is significant. To understand the circumstances of this difference, we would only need to compare the average value of posttests in the experimental and control groups in terms of the mentioned dependent variables. According to the results indicated in Table 1, the average scores of AS and NA in posttest were 19.42 and 35.86 in the experimental group and 23.07 and 29.46 in the control group, respectively. This indicates the reduced average score of these variables in the experimental group, compared to the control group.

The average score of PA in posttest was 34.21 for the experimental group and 29.86 for the control group. This suggests that the average score of the experimental group increased in posttest, compared to the control group. Therefore, hypotheses 1, 2, and 3 regarding the effectiveness of CBT on AS and PA/NA among female students of Ahvaz Jundishapur University with social anxiety symptoms were confirmed.

4. Discussion and Conclusion

Regarding the effect of CBT based on Hoffman's model on AS, the results showed that CBT intervention leads to the

Table 4. Multivariate Analysis of Covariance (MANCOVA)

	Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Pillai's trace	0.868	112.038	3	22	0.0001	0.868
Wilks's lambda	0.132	112.038	3	22	0.0001	0.868
Hotelling's trace	6.55	112.038	3	22	0.0001	0.868
Roy's largest root	6.55	112.038	3	22	0.0001	0.868

Table 5. One-Way Analysis of Covariance in MANCOVA

Dependent Variables	Sum of Squares	df.	Mean Square	F	Sig.	Partial eta Squared
AS	1128.84	1	1128.84	35.11	.0001	s0.59
PA	204.05	1	204.05	65.08	.0001	0.73
NA	364.83	1	364.83	50.16	.0001	0.68

alleviation of AS among students, compared to the control group; findings of this study are in line with previous research (17-20). To clarify this hypothesis, it may be said that increased response to physiological sensations is a feature of anxiety disorders (36), which often leads to the utilization of incompatible strategies to reduce such sensations.

One of the CBT-based strategies, used to target sensitivity for physical sensations of anxiety, is interceptive exposure (37), which includes repeated arousal of physiological sensations related to anxiety and fear (38). Through frequent exposure to frightening feelings in the absence of intimidating consequences, new information will be recorded which does not approve irrational beliefs about these sensations and consequences (39). Moreover, individuals' increased capability to cope with anxiety-related sensations and increased emotional acceptance through learning how to stand emotions without trying to change or control them (37) is another consequence of interceptive exposure.

In the intervention based on Hoffman's model, the assumption that perception of control on an individual's anxiety responses in relation to threatening events may be an important mediator of treatment outcomes in SAD helps patients learn that anxiety sensations can be easily tolerated and there is no need to ruin one's social function.

Also, in this interventional model, by considering the assumption that those with social anxiety shift their attention inward and engage in a process of detailed self-monitoring upon encountering a social threat, provision of some physical stimulation exercises to improve their social exposure teaches the patients that social objectives are reachable, regardless of the presence or absence of signals (40); also, they learn that these threats should not be considered in the interpretation of social failure experiences.

Therefore, practical exercises in different attention situations would not only help patients have different experiences considering the changing direction of their attention, but also make them repeat this active shift of attention in a social setting. Consequently, increasing one's tolerance of physiological sensations and not interpreting these sensations as an alarm for destruction of social functioning would lead to reduced AS in an individual.

Also, in the present study, regarding the effectiveness of CBT based on Hoffman's model on affects, CBT intervention could lead to the alleviation of NA and rise of PA among students, compared to the control group; findings of this study are in line with previous research (21, 22). To clarify this hypothesis, it may be said that emotions and behaviors related to social anxiety are due to cognitions, especially beliefs and evaluations people maintain in relation to themselves under social circumstances (8, 9).

Individuals with social anxiety tend to set lower expectations, express themselves less frequently, and show less PA, compared to non-anxious people (41); also, they do not use opportunities to follow activities which may create PA (42). Besides assessing the occurrence of positive events with less possibility and having a weak self-perception, these individuals also show a discrepancy between perceived social standards and perceived social capabilities; this leads to more frequent NA experiences.

Given the fact that individuals with social anxiety consider high standards for themselves, Hoffman-based CBT shows that information about social standards moderates retrospective self-appraisal of social performance. Therefore, one of the objectives of this treatment is to clarify actual standards for the individual's performance. Hence, during the intervention, these standards will be suspected and challenged through a cognitive intervention.

In addition, since those with social anxiety have a negative self-perception about themselves, Hoffman's intervention corrects the individual's self-perception using special techniques, believing that reducing self-criticism would lead to the improvement of self-confidence and empowerment of self-perception (40). Since negative self-perception plays a central role in the continuation of social anxiety, changing it directly mediates treatment changes. Therefore, moderating social standards and correction of self-perception may lead to the improvement of affects.

The results regarding the effect of intervention over time also suggest the stability of CBT based on Hoffman's model on AS and PA/NA of female students with social anxiety symptoms at Ahvaz Jundishapur University. Since the present study was conducted on BSc students, generalization of the results to the students of other educational systems must be handled with care. Also, this study was only conducted on girls; therefore, generalization to boys should be made with care.

Finally, it is recommended that future studies examine this intervention in different samples such as children and the elderly in different settings such as schools and families. Since the sample of the present study only consisted of girls, it is recommended that future studies focus on boys, as well. It is also suggested to use this method to prevent the formation of emotional disorders.

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Footnotes

Authors' Contribution: Soodabeh Bassak Nejad, Nasrin Arshadi, Mahnaz Mehrabizadeh Honarmand, and Ahmad Fakhri were responsible for the study supervision; Khadijeh Roushani was responsible for the analysis and interpretation of data, drafting of the manuscript, statistical analysis, and data acquisition.

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