

A Comparative Study of Dialectical Behavior Therapy and Aripiprazole on Impulsive Behavior in Hypersexual Patients

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Abstract

Background: Sexual desires and sexual activities are one of the natural needs of every human being, which if not used in the right direction, may become problematic and lead to various sexual disorders, including hypersexuality. The aim of this research was to compare the dialectic behavior therapy and aripiprazole drug on impulsive behavior in hypersexual patients

Methods: The paper is an experimental study based on control and treatment groups with pre-test and post-test and follow up. 54 male and female patients with hypersexuality having at least diploma, from four hospitals and psychiatric centers of Isfahan, were selected and assigned randomly in two groups of treatment (18 patients in every group) and one group of control (18 patients). Pre-test stage was done for three groups by Barratt Impulsiveness Scale Version 11 (BIS- 11). The first treatment group underwent DBT intervention for 8 sessions of 2 hours (once a week) and the second experimental group was prescribed aripiprazole for two months. Afterwards, the post-test and follow up was done for all three groups.

Results: A significant difference was observed regarding the variable of impulsive behavior and all its components between the experimental and control groups ($P<0.05$). And the drug Aripiprazole had an effect on the motor impulsivity component of impulsive behavior and improved it ($P<0.01$). Also, there is a difference between the effects of DBT and aripiprazole, with the greater effect of DBT, in the variables of impulsive behavior ($P<0.01$).

Conclusion: Based on the results, it can be said that the intervention of DBT and aripiprazole drug can have an effect on impulsive behavior of patients and DBT can be used as an complementary treatment.

Keywords: Dialectical Behavior Therapy, Aripiprazole, Impulsive Behavior, Hypersexuality.

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Introduction

Sexual desires and activities are one of the natural needs of human beings, but if not used rightly, it may lead to various disorders, including hypersexuality, which can affect behavior, emotions, job, social relationships, and other aspects of a person's life ¹.

The prevalence of hypersexuality among women and men is almost the same (previous research has shown that the prevalence of problematic sexual behavior can be between 2 and 6%), and its highest prevalence is from 25 to 55 years of age ². Hypersexuality disorder or sexual hyperactivity is sometimes also known as sexual addiction

or hypersexual disorder (HD), compulsive sexual behavior disorder (CSBD), sexual compulsivity, and hypersexual behavior ^{2, 3}. Hypersexuality, as an impulse control disorder, is proposed in ICD-11 with the code "6C72". In the present study, hypersexuality was diagnosed based on the definition and clinical instructions of ICD-11 ⁴. Also, it is important to note that the current study aims to study people with non-paraphilic hypersexual behavior (called hypersexuals).

At times, sexual behaviors may be too compulsive and cause severe problems in people's lives, especially

couples, so investigating impulsive behaviors among hypersexual couples is worth being taken into account. Self-control helps people make better decisions and achieve worthwhile goals. On the contrary, impulsive behavior is caused by a low level of self-control, and it is a negative, defective, and ineffective behavior. People with impulsive behavior do not often have proper control over their behavior, and the reactions they show to events around them are too unnatural. These people cannot have proper social interactions with the people around them and push away others around them with their behavior. As a result, they get isolated from the society⁵. Hypersexual patients also have "excessive" or "out of control" sexual behaviors, as a result of which they feel distressed⁴. Impulsive behaviors of these people include limited control of imaginations, pressures, and excessive (abnormal) sexual behaviors that may cause discomfort to themselves or their partners. Therefore, a hypersexual person does not have the ability to control his/her sexual actions and behaviors⁶.

The advancement of medical technology and behavioral, cognitive, emotional, social, and communication factors have made effective therapeutic interventions more obvious for hypersexual patients in recent years. Due to the unique nature of many paraphilias, treatment methods may range from pharmacological and psychotherapeutic interventions to more severe interventions (e.g. chemical castration, isolation, and incarceration) for dangerous or illicit sexual desires². Thus, the present study focuses on the treatment of hypersexuality (non-paraphilic hypersexuality), which does not require the aforementioned intense interventions and focuses on pharmacological and psychotherapeutic interventions. In this research, DBT and Aripiprazole interventions are used to reduce the problem of impulsive behavior among these couples.

Despite the relative effectiveness of Aripiprazole, some medical interventions such as SSRIs (Selective Serotonin Reuptake Inhibitors), antiandrogens, and other well-known standard and common psychiatric drugs are used for these disorders⁷⁻¹⁰. Aripiprazole is an antipsychotic medicine and a partial agonist of the D2 dopamine receptor, which is rarely associated with sexual side effects (low libido). By increasing prolactin levels, Aripiprazole is used to relieve side effects and impulsive behaviors including pathological gambling, excessive shopping, and hypersexuality¹¹. Of course, sometimes sexual dysfunction such as hypersexuality is a significant reason for non-adherence to antipsychotic treatment in patients with mental health disorders¹¹; this rare complication was completely under control by the researchers in the present study.

Regarding psychological treatments for the problems of hypersexual couples, we may refer to psychoanalytic treatments, couple therapy, and behavioral therapy¹²⁻¹³. DBT (Dialectical Behavior Therapy) is one of the approaches that has a long-term effectiveness with skill enhancement through intervention in the field of cognition, emotion, and behavior¹⁴. Considering the role of hypersexuality in impulsive behavior in the life of couples, treatments that emphasize improving conflicts and contradictions to resolve interpersonal conflicts and obtain social support can play an important role in treating and preventing the complications of hypersexuality in the lives of couples. One of the innovations in psychological treatments that emphasizes both skill training and emotion regulation skills is DBT, which involves four intervention components in its group therapy method, including mindfulness and distress tolerance as "acceptance components", and emotional regulation and interpersonal effectiveness as "change-based components." Research results have confirmed the effectiveness of DBT on reducing couples' conflicts, increasing marital satisfaction, regulating couples' emotions on the verge of divorce, improving interpersonal relationships, and reducing violent behaviors and sexual impulsivity¹⁵.

The main problem of this research originates from the fact that despite the beneficial effects of DBT and Aripiprazole, the literature review shows a gap of such studies on disorders such as hypersexuality. It is assumed that the basis of this disorder is dopamine regulation problems followed by emotional problems, so considering the current article and research background^{2, 11}. The research assumes that the lack of dopamine regulation, or in other words, its high amount, can be the basis of creating hypersexuality. Therefore, the goal of the treatment is not to reduce sexual desire due to the side effects of drug use but to regulate the dopamine neurotransmitter, followed by the regulation of sexual behaviors, and also emotional-based psychotherapy seems necessary.

It is worth mentioning that the superiority of the current research can be that it simultaneously investigates two independent variables, DBT and Aripiprazole, and an important psychological dependent variable that can be a problem in the lives of hypersexual patients, and it focuses on both aspects of physical and psychological health of these patients. The debate on whether the effect of drug therapy and psychotherapy is different or the same in such cases is scientifically important and interesting, and at the same time, it can probably increase the strength of a research work and make it more valuable for the scientific community and practical use. So the aim of this research was to compare the dialectic behavior therapy

and aripiprazole drug on impulsive behavior in hypersexual patients.

Methodology

An applied semi-experimental study was conducted based on the design of three control-experimental groups with pre-test, post-test, and follow-up.

The statistical population was included the hypersexual patients referred to four hospitals and psychiatric centers in Isfahan, Iran, including Khurshid Hospital, Asegariyeh Specialized Hospital, Farhangian Clinic of Isfahan, and Hazrate Imam Reza (AS) Medical Center. In the experimental research, the number of samples was calculated to make possible giving valid and scientific answers to the research questions. Based on 80% test power, 5% error, and 0.9 standard deviation according to Cohen's equation, the minimum number of subjects for each group was 20. Considering the mentioned point and since a quantitative and experimental research was conducted, also assuming attrition, 20 people were selected purposefully as the sample size for the control group, 20 people for the first experimental group, and 20 people for the second experimental group. After the initial evaluation, they were assigned into three control and experimental groups. Finally, considering the samples drop, 54 people were included as samples in three groups with 18 individuals. In the first experimental group, DBT was provided (eight 90-min sessions by a trained therapist); in the second experimental group, Aripiprazole was given at the beginning with an initial dose of 5 mg daily. According to the psychiatrist's diagnosis, if the dose was needed to be increased, this was prescribed once a week until the final increase to a daily dose of 20 mg (if tolerated) for 2 months. After completing these stages, the variables of BIS-11 questionnaire was re-presented as a post-test; 6 months later, a follow-up was conducted (after 2 months of drug administration, it was continued for 6 months with a specific dose until the follow-up phase was carried out to stabilize the drug therapy period according to the diagnosis of the psychiatrist). The main reason for the follow-up period was to investigate possible late side effects, including Tardive Dyskinesia, which usually occurs 3 to 6 months after starting the drug. Also, changes in the recurrence of symptoms, changes in mood, and other cases were also investigated in the follow-up period. At the end, all subjects were thanked.

The inclusion criteria were: diagnosis of hypersexuality as a unique diagnosis based on the ICD-11 classification, having at least a diploma degree, being over 20 years of age, being married, and not receiving any other educational program before and during DBT. The exclusion criteria were: simultaneously suffering from a

severe psychiatric disease and hypersexuality and using psychiatric drugs, patients treated with Levo-Dopa, substance abuse, frontal lobe disorders or schizophrenia, pregnant women, breastfeeding mothers, and people at risk of suicide. Also, in the clinical interview and periodical examinations of the patients, all possible side effects were taken into account; in case of any side effects, they were recorded and evaluated, and the monitoring of the side effects of Aripiprazole, especially cardiac side effects, was carefully taken into consideration. The eligible individuals were assigned in one control group and two experimental groups. In all three stages, the "Barratt Impulsiveness Scale Version 11 (BIS-11)" was implemented for all three groups, and finally, the data were analyzed using SPSS 22 software.

Ethical considerations

The present study, following the accepted scientific standards and observing the principle of "Ethical Code of Research", was proposed in the Research Council Commission for Research Development Management, Research Evaluation, and Coordination of Research Centers of Isfahan University of Medical Sciences and was accepted on 23 August, 2021 and received the ethical code of IR.MUI.MED.REC.1400.421 from Isfahan University of Medical Sciences.

The Barratt Impulsiveness Scale Version 11 (BIS-11; Patton, Stanford & Barratt, 1995) with 30 questions measures the three components of impulsivity (questions 1-10), motor impulsivity (questions 11-20), and cognitive impulsivity (questions 21-30). This questionnaire is scored based on a four-point Likert's scale (never = 1, sometimes = 2, often = 3, and almost always = 4). In addition to the score of each subscale, a separate score was calculated for the whole impulsivity scale. To prevent the subjects from creating an answer style, some questions were written in such a way to show the lack of impulsivity and were scored reversely (questions 1, 7, 8, 9, 10, 12, 13, 15, 20, 29, and 30) so that the score of 1 indicates the least amount of impulsive behavior and 5 indicates the highest amount of impulsive behavior. The score range is 30 – 120, and the cutoff point is 75. In the research of Van Dongen et al, De Groot, Rassin, Hoyle, and Franken (2021), Cronbach's alpha was reported as 0.88. In a preliminary research, Purkord (2011) reported the Cronbach's alpha coefficient and re-test reliability coefficient (after one month) of this scale as 0.87 and 0.79, respectively, and its validity coefficient was 0.77.

Table 1: Brief description of DBT sessions based on Marsha Linehan's instructions*

Brief description	Sessions
Familiarity with the concept of mindfulness and three mental states (logical mind, emotional mind, and rational mind)	Session 1 (mind-fullness 1)
Training two sets of skills to achieve mindfulness: category one "what" skills (i.e. observing, describing, and contributing); category two "how" skills (i.e. a non-judgmental stance, inclusive self-awareness, and effective functioning)	Session 2 (mind-fullness 2)
Teaching distraction strategies and diverting the mind with ACCEPTS skills (activities, contributing, comparisons, emotions, pushing away, thoughts, and sensation)	Session 3 (distress tolerance 1)
Teaching self-soothing through the five senses	Session 4 (distress tolerance 2)
Teaching the pattern of identifying emotions and labeling them, which increases the control of emotions	Session 5 (regulation of emotions 1)
Teaching to create positive emotional experiences through creating short-term positive emotional experiences	Session 6 (regulation of emotions 2)
Situations for effective communication and interpersonal efficiency (proper proportion between one's own desires and the desires of others; the ratio of desires and musts)	Session 7 (effective communication and interpersonal efficiency 1)
The goals of effective communication and interpersonal efficiency (achieving goals in a situation and dealing with resistance and conflict)	Session 7 (effective communication and interpersonal efficiency 2)

* Linehan MM. Cognitive-Behavioral Treatment of Borderline Personality Disorder. New York, NY: Guilford Press; 1993

Data analysis was done using SPSS 24 statistical software. The descriptive results include the statistical indices of mean and standard deviation. Also, to assess the research hypotheses, the statistical method of multivariate analysis of covariance (MANCOVA) was used. Kolmogorov-Smirnov test was used to assess the normality of the data; Leven's test was used to confirm the homogeneity of variances. Box'M test was used to check the correlation homogeneity between the research variables.

Results

Analysis of covariance requires compliance with statistical assumptions such as 1) normality,

2) homogeneity of variances, 3) homogeneity of regression slopes, and 4) multiple collinearity, which were analyzed (P<0.05). The normality presumption was confirmed by the Shapiro-Wilk test. Leven and Box'M test (F=1.41) also indicated equality of variances, so the analysis of covariance can be used. Tables 2 and 3 are, respectively, related to the results of the analysis of covariance for the comparison of two groups (experimental group one and the control group; the experimental group two and the control group) regarding the impulsive behavior variable. Table 4 is related to the results of the analysis of covariance for the comparison of three groups regarding the impulsive behavior variable.

Table 2: The results of variance test with repeated measurements related to in-group and out-group effects of DBT in the groups

Score	Source	sum of squares	Degrees of freedom	Mean square	F	Significance level	η	Statistical power	
Disorganization	Inter group	Test	203/11	1/14	177/39	12/88	0/001	0/44	0/94
		Test and group interaction	188/59	1/14	164/71	11/96	0/002	0/42	0/92
	Between group	Group	262/24	1	262/24	5/18	0/037	0/24	0/57
Motor impulsivity	Intergroup	Test	229/59	1/17	195/19	13/22	0/001	0/45	0/95
		Test and group interaction	270/70	1/17	230/14	15/59	0/001	0/49	0/97
	Between group	Group	373/40	1	373/40	5/63	0/03	0/26	0/60
Cognitive impulsivity	Intergroup	Test	830/03	1/20	691/13	20/33	0/000	0/56	0/99
		Test and group interaction	783/37	1/20	652/27	19/18	0/000	0/54	0/99
	Between group	Group	1157/40	1	1157/40	4/69	0/046	0/22	0/53
Impulsive behavior	Intergroup	Test	3369/33	1/13	2963/24	24/52	0/000	0/60	0/99
		Test and group interaction	3380/59	1/13	2973/14	24/60	0/000	0/60	0/99
	Between group	Group	4835/57	1	4835/57	7/38	0/015	0/31	0/72

According to [Table 2](#) and since the variable of impulsive behavior and its components became significant through time ($P<0.01$), a difference was observed between the three stages of pre-test, post-test, and follow-up in this variable and its components. The analysis of these differences was done using Bonferroni's post hoc test.

Also, there was an interaction between group and time regarding the impulsive behavior variable and its components ($P<0.01$), indicating a difference between the pre-test and post-test stages and follow-up between the treatment and control groups with regard to the dependent variable. These differences were investigated using Bonferroni's post hoc test. Regarding the group

effect and the F-values and significance levels, a significant difference was observed regarding the variable of impulsive behavior and all its components between the experimental and control groups ($P<0.05$). A two-by-two comparison of these groups for each assessment stage separately (pre-test, post-test, and follow-up) is presented below. The effect size column in the [table 2](#) also shows the effect of DBT on the variable of impulsive behavior and its components, which can be observed according to its values. The effects of treatment were 31% on impulsive behavior, 24% on disorganization, 26% on motor impulsivity, and 22% on cognitive impulsivity.

Table 3: The variance test results with repeated measurements related to in-group and out-group effects of Aripiprazole in the groups.

Score	Source	sum of squares	Degrees of freedom	mean square	F	Significance level	η	Statistical power	
Disorganization	Inter group	Test	22/37	1/61	13/82	4/62	0/025	0/22	0/67
		Test and group interaction	16/14	1/42	11/36	3/33	0/068	0/17	0/52
	Between group	Group	90/47	1	90/47	1/34	0/26	0/077	0/19
Motor impulsivity	Inter group	Test	80/03	2	40/01	8/88	0/002	0/33	0/93
		Test and group interaction	108/25	2	54/13	10/66	0/000	0/40	0/98
	Between group	Group	83/13	1	83/13	1/07	0/3	0/063	0/16
Cognitive impulsivity	Inter group	Test	195/59	1/42	137/20	5/80	0/016	0/26	0/73
		Test and group interaction	181/14	1/42	127/06	5/37	0/020	0/25	0/69
	Between group	Group	35/85	1	35/85	0/089	0/7	0/006	0/059
Impulsive behavior	Inter group	Test	718/81	2	359/40	10/52	0/000	0/39	0/98
		Test and group interaction	748/59	2	374/29	10/95	0/000	0/40	0/98
	Between group	Group	167/13	1	167/13	0/18	0/67	0/012	0/069

According to [Table 3](#) and since the variable of impulsive behavior and its components became significant through time ($P<0.05$), a difference was observed between the three stages of pre-test, post-test, and follow-up with regard to this variable and its components. These differences were analyzed using Bonferroni's post hoc test.

Also, an interaction was observed between group and time regarding the variable of impulsive behavior and the two components of motor and cognitive impulsivity ($P<0.05$), indicating a difference between the pre-test, post-test, and follow-up stages between the treatment and control groups regarding the dependent variable. The

results also revealed no interaction between the group and time regarding the disorganization component ($P<0.05$), indicating no difference between the pre-test, post-test, and follow-up stages between the treatment and control groups in the unplanned component. These differences were analyzed using Bonferroni's post hoc test.

Also, regarding the group effect and the F-values and significance levels, no significant difference was observed regarding the impulsive behavior variable and all its components between the experimental group (Aripiprazole) and the control group ($P<0.05$). A two-by-two comparison of these groups was done separately for each assessment stage (pre-test, post-test, and follow-up)

Table 4: The results of variance test with repeated measurements related to in-group and out-group effects of DBT and Aripiprazole in the groups.

Score	Source	sum of squares	Degrees of freedom	mean square	F	Significance level	η	Statistical power	
Disorganization	Inter group	Test	224	1/24	180/53	16/86	0/000	0/41	0/99
		Test and group interaction	205/92	2/48	82/98	7/75	0/001	0/48	0/95
	Between group	Group	264/96	2	132/48	2/52	0/10	0/17	0/45
Motor impulsivity	Inter group	Test	407/21	1/50	270/49	22/64	0/000	0/48	1
		Test and group interaction	279/82	3/01	92/93	7/78	0/000	0/39	0/98
	Between group	Group	373/89	2	186/90	2/74	0/084	0/18	0/49
Cognitive impulsivity	Inter group	Test	1194/39	1/32	899/95	24/35	0/000	0/50	1
		Test and group interaction	793/90	2/65	299/09	8/09	0/001	0/40	0/97
	Between group	Group	1862/61	2	931/30	3/38	0/05	0/22	0/58
Impulsive behavior	Inter group	Test	4780/22	1/36	3509/68	35/28	0/000	0/59	1
		Test and group interaction	3434/37	2/72	1260/77	12/67	0/000	0/51	0/99
	Between group	Group	5471/63	2	2735/81	4/19	0/027	0/25	0/68

According to [Table 4](#) and since the impulsive behavior variable and all its components became significant through time ($P < 0.01$), a difference was observed between the experimental and control groups in the three stages of pre-test, post-test, and follow-up in this variable and its components. Also, the results of the table show an interaction between group and time regarding the variable of impulsive behavior and components of motor and cognitive impulsivity ($P < 0.05$). Therefore, there is a difference between the pre-test, post-test, and follow-up stages between the two treatment groups and the control group regarding the dependent variable.

Moreover, considering the group effect and the F-values and significance levels, a significant difference was observed regarding the variable of impulsive behavior and the component of cognitive impulsivity between the two experimental groups (DBT and Aripiprazole) and the control group ($P < 0.05$). The two-by-two comparison of these groups was done separately for each assessment stage (pre-test, post-test and follow-up).

Discussion

This study was done to compare the dialectic behavior therapy and aripiprazole drug on impulsive behavior in hypersexual patients.

To explain the effectiveness of DBT on impulsive behavior, it should be stated that DBT is actually a change in and modification of cognitive-behavioral therapy and is used in people who have out-of-control emotions as well as mood and emotional issues such as depression, anxiety, anger, emotional instability, and irritability, and clinicians are asked to help the client understand disruptive behaviors as acquired behavior to solve the problem, and the client lacks the necessary skills to respond more creatively. This is one of the reasons that dialectical therapy has been effective in reducing negative emotions and impulsive behaviors [15](#). Hypersexual people who have problems with impulse control are increasingly impulsive and irresponsible, which are characterized above all by the lack of negative emotions regulation and are cognitively messed up. In addition, they show their lack of regulation of positive emotions, which causes irrational and superficial excitement [16](#). Since these people lack rational thinking, they cannot have planned and pre-planned behavior nor can they pay attention to the

consequences of their actions, when trying to free themselves from social obligations and compulsions.

Therefore, one of the reasons for the success of dialectical behavior therapy is the reduction of inappropriate emotions, including impulsivity ¹⁷. Accordingly, the training of interpersonal efficiency skills in dialectical therapy leads to an increase in emotional stability and interpersonal characteristics since these people need to be accepted by others. In fact, these people are more aggressive than usual because of underlying character issues or because their basic needs are not met by insensitive caregivers. These people have always been in a relationship of dependence and independence, which leads to ambivalence and unstable relationships, absurdism, looking for too close relationships or ideal fusion, and so on. Training interpersonal efficiency skills in dialectical therapy helps to identify communication styles, fitting of one's own desires and others', and identifying interpersonal relationships and problems, the amendment of which will lead to a reduction in impulsivity ¹⁸.

To elaborate on the effect of Aripiprazole on the reduction of impulsive behavior in these patients (motor impulsivity component), literature review demonstrates that Aripiprazole can be effective in reducing the hypersexuality of patients and their sexual impulses ¹⁹. Also, there is a growing body of research on pathological behavioral changes, including hypershopping and hypersexuality, associated with dopamine agonists that occur during the treatment of dopamine-related disease ²⁰. Aripiprazole is the only antipsychotic drug that has dopamine agonist properties, which acts as a dopamine antagonist, and clinically, it shows itself as an anti-psychotic or anti-manic agent ²¹. Therefore, to explain the effect of this drug on the impulsivity of hypersexual patients, Aripiprazole can stimulate dopamine receptors in specific areas of the brain that are related to impulse control and addiction, in the same way that dopamine agonists stimulate. Furthermore, it is clear that the greater the receptor reserve, the more activation the partial agonist can produce. The limbic dopaminergic projection from the ventral tegmental area is involved in addiction and rewarding experiences, such as food, intercourse, and addictive drugs. Therefore, the limbic system of the brain, which regulates the impulsive behavior, such as sexual desire, have more additional dopamine receptors than other areas of the brain. Hence, Aripiprazole can reduce the disorganization rate in hypersexual patients by affecting these receptors.

On the other hand, the dopamine neurotransmission pattern consists of two different components, tonic and phasic. Since hypersexual people show defects in the

tonic pattern and a tendency towards the phasic pattern, Aripiprazole can improve the tonic pattern and weaken the phasic pattern by regulating dopamine. Since Aripiprazole has a high affinity with D2 receptors, about 90% of D2 receptors are occupied by it, and tonic and phasic dopamine transmission is blocked. However, its intrinsic activity and long half-life add to its dopaminergic potency. This unique effect of Aripiprazole on dopaminergic transmission may be one of the reasons for reduction and change in cognitive behaviors. Another possible explanation for the behavioral effects of Aripiprazole is the involvement of the dopamine D3 receptor, which is highly enriched in the nucleus accumbens and plays an important role in reward. It has been assumed that dopamine agonists with high affinity for the D3 receptor tend to cause addictive-impulsive behavioral abnormalities in dopamine dysregulation syndrome. A recent report showed that Aripiprazole acts as a partial agonist of D3 receptors, while other antipsychotic drugs do not show any agonistic activity ¹⁹. Therefore, the stimulation of D3 receptors in limbic areas by Aripiprazole may be associated with pathological behavioral changes, especially impulsivity reduction.

To explain the difference in the effectiveness of DBT and Aripiprazole on impulsive behavior (cognitive impulsivity component), assuming the present findings, impulsivity shows up frequently in hypersexual patients. This disorder appears with motor impulsivity, cognitive impulsivity, and lack of planning in sexual relations. To explain the higher effectiveness of DBT behavior compared to Aripiprazole, the DBT protocol, consisting of problem solving skill training, awareness of interrelationships and emotions' interaction, thoughts, and behavior, increases controlled destructive and impulsive behaviors in hypersexual patients. Basically, learning cognitive, behavioral, and emotional dialectical strategies can eventually be generalized to situations outside of intervention, and its effectiveness can be increased with practice and repetition ²².

On the other hand, intervention in the daily life plan of patients can, in turn, affect emotions' management since the daily lifestyle of every person, whether healthy or sick, causes emotional dysregulation such as aggression, restlessness, increased sexual desire, weak impulse control, and concentration problems. In fact, one of the important DBT techniques for regulating maladaptive emotions is reducing physical vulnerability. This is a case where accurate training to patients is crucial, and these trainings are absent in drug therapy ¹⁵. Moreover, since impulsive behaviors of these patients accompany with other traumatic behaviors such as sexual promiscuity, dysfunctional interpersonal relationships (such as sexual

abuse and emotional exploitation by sexual partners inside and outside the family, substance abuse, eating disorders, depression, homelessness, periods of long-term unemployment, and impulsive behaviors), emotion regulation trainings with emotional programs can be helpful in clarifying the importance of treating impulsive behaviors. This issue is visible in emotion-oriented psychotherapies such as DBT, so the effect of DBT on some components of the impulsive behavior of hypersexual patients was greater than Aripiprazole.

DBT and Aripiprazole intervention can be used to improve mental health and resolve psychological problems of hypersexual patients. Urologists, gynecologists and obstetricians, and health psychologists, clinical psychologists, and psychiatrists can help patients to reduce the amount of physical and mental complications and side effects of this disease, and make these patients suffer less troubles in their lives. This research was conducted in the mentioned medical centers of Isfahan; therefore, it is better to be cautious in generalizing its results to other similar hospitals, clinics, and research institutes. Also, people's reactions to some DBT techniques are not only different in different societies, but also different in different groups of the same society. It should be noted that in people with a high risk of hypersexuality disorder, Aripiprazole should be used to prevent problems related to it.

This study had some limitation such as the subjects could not easily provide us with their information about this disorder and it is still taboo in our society. It is also suggesting to do further studies with more samples and on the special groups of individuals.

Highlights

What Is This Study Already Known and Add?

With regard to psychological interventions and in order to increase the quality of life of couples and reduce impulsive behaviors, it seems necessary to conduct experimental research to reduce these problems in new and creative ways. Obviously, DBT is an emotion-oriented treatment, and the drug aripiprazole, which has the least sexual side effects (decreased libido) and is essentially a dopamine "regulating" drug, is an adjunct in this regard. Also, in addition to investigating the effect of DBT and aripiprazole on the changes mentioned in these cases, the comparison of these two treatment methods is essential for this study. Because the subject under discussion, the difference or the same effect of drug therapy and psychotherapy in such cases, is scientifically important and of interest, and at the same time, it can help the strength of a research work. make it more valuable for the scientific community.

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Authors' Contributions

All Authors designed and directed the project; Zahra Tavakilo and Iman Ghanaat performed the experiments; Hasan Rezaei-Jamalouei and Hamid Kazemi-Zahrani analysed spectra; Mohammad Hatf Khorrami made the simulations; all authors developed the theoretical framework; Zahra Tavakoli wrote the article.

Conflicts of Interest Disclosures

There are no conflicts of interest.

Consent For Publication

All authors consent to publish the article.

Ethics approval

The present study, is following of Committee on Publication Ethics (COPE) and complies with the highest ethical standards in accordance with ethical laws, and following the accepted scientific standards and observing the principle of "Ethical Code of Research", was proposed in the Research Council Commission for Research Development Management, Research Evaluation, and Coordination of Research Centers of Isfahan University of Medical Sciences and was accepted on 23 August, 2021 and received the ethical code of IR.MUI.MED.REC.1400.421 from Isfahan University of Medical Sciences.

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