

The impact of a Transtheoretical Model-based intervention on symptoms of depression with the mediator of attitude to pornography in homosexual men: A pilot study

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Abstract

Background: Transtheoretical Model (TTM) is a new approach to the treatment of addiction. The purpose of this study was to investigate the efficacy of TTM in reducing depression by a pornography mediator variable.

Methods: In this quasi-experimental study with pretest and posttest, 72 homosexual males with methamphetamine dependents in Tehran from were recruited from 15 December 2014 to 20 November 2015 during a seasonal meeting. They were selected by snowball method from among those who obtained the highest scores in the index of pornography (response rate=94%). They were subsequently assigned into experimental (3 levels) and control (3 levels) groups based on the three levels of pornography, i.e., low, moderate and high. The TTM-based intervention was presented to the experimental groups for 12 weeks, and the control groups were placed on the waiting list. The data were collected via a researcher-made demographics form, Beck's Depression Inventory, and the Stages of Change Readiness and Treatment Eagerness Scale. The data were analyzed using Two-factor analysis of variance (ANOVA) and Scheffe's post-hoc test in the IBM SPSS Software Version 20 (IBM Corp., Armonk, NY, USA).

Results: The TTM-based intervention had a significant impact on the two depressive groups who had moderate ($p < 0.05$) and low ($p < 0.01$) pornography use, but it had no significant effect on high-pornography index ($p > 0.05$). Also, Chi-square test showed that only groups with lower pornography indices had a significant difference in the stages of change.

Conclusions: While having applicability in this area, the findings of this study can be helpful in planning supplementary remedial procedures and can help practitioners for better interventions in order to fulfill the needs of individuals with depression.

Keywords: Homosexuality; Depression; Methamphetamine; Trans-theoretical model; Pornography; Addiction

1. Introduction

According to estimates, nearly 70% of new cases of HIV infection occur in homosexuals and in particular in homosexuals with multiple sexual partners (1). Methamphetamine is one of the most commonly abused drugs worldwide, which has an undeniable role in the development of high-risk sexual behaviors. Today, recreational use of Methamphetamine is highly prevalent among urban homosexual men (52%), and it is associated

with high risk sexual behaviors (2). Hence, there is a pressing need for effective interventions to reduce the prevalence of HIV in methamphetamine-dependent heterosexual men (3). On the other hand, negative mood status, especially depression among methamphetamine users, is high and there is a positive correlation between methamphetamine daily consumption and the depression rate (4). Given the alterations in the HPA axis, these individuals exhibit changes in levels of stress hormones that can lead to depression, anxiety, and recurrence. In an

evolutionary perspective, experience of methamphetamine in teenage periods will increase depressive behaviors in adulthood (5). In fact, the emergence of depression syndromes plays a moderating role in calling for high risk behaviors. Evidence shows that people with depression symptoms are more likely to be involved in behaviors that are harmful to the health (6). On the other hand, statistics show that homosexual men are among the most common viewers of pornographic films (7).

Researchers have provided a number of definitions for pornography. Malamuth and Huppert (8) define pornography as "explicit sexual content" that is provided aimed at sexual arousal of the viewer. It is characterized by the use of pornography related to sexual temptation, attraction in unprotected anal activities, and the desire for sexual intercourse with a third party. What is important from a clinical point of view is the connection between the uses of pornographic films with mental health problems including depression. In the study of Weaver et al (9), users of pornographic films had more depressive symptoms, lower quality of life, and lower health status compared with the control group.

On the other hand, one of the popular therapies among addiction therapists is the model of stages of change, or trans-theoretical model (TTM), which has been widely used in the field of addiction treatment (10, 11). The model was developed by Prochaska and DiClemente with the goal of smoking cessation therapy (12). It describes how to modify an inappropriate behavior or develop a positive behavior, and includes five steps: (1) Pre-contemplation stage (Not Ready): People in the Precontemplation stage do not intend to take action in the foreseeable future, usually measured as the next six months; (2) Contemplation stage (Getting Ready): It is the stage in which people intend to change in the next six months. They are more aware of the pros of changing, but are also acutely aware of the cons; (3) Preparation stage (Ready): Preparation is the stage in which people intend to take action in the immediate future, usually measured as the next month; (4) Action stage: Action is the stage in which people have made specific overt modifications in their lifestyles within the past six months; (5) Maintenance stage: Maintenance is the stage where people have made specific overt modifications in their lifestyles and are working to prevent relapse; however, they do not apply change processes as frequently as do people in the Action stage (12). The TTM can be considered as a

cognitive and motivational point of view. Motivational components play an important role in consuming or avoiding. According to Serafini et al (13), there is a relationship between the amount of motivation and drug abuse in schoolchildren. Recent evidence indicates the pragmatic value of this model (11, 14-16).

In light of what has been described above and given the wide use of pornographic films by homosexuals as well as the relationship between the use of pornography and the incidence of depression syndromes, we intend to study the impact of a TTM-based intervention on depression given the use of pornography in methamphetamine-dependent homosexuals.

2. Methods

Data collection:

The present study is a quasi-experimental study. Data of the present study were collected during 15 December 2014 and 20 November 2015, using survey and structured clinical interviews. Therapeutic intervention and data collection were carried out in two addiction treatment clinics in the 7th and 9th districts of Tehran. In this study, taking into account the one-sidedness of the test and putting $\alpha=0.05$, $z=1.645$ as the basis, as well as the test power of $1-\beta=0.84$, the sample size in each group was estimated as 12 people totaling 72 given the six groups.

In the implementation of this study, a physician, a psychologist, a clinical psychiatrist and a nurse participated and the results were analyzed by a psychometrist. Also, qualitative measures such as observation and clinical interviews were performed by the psychologist and evaluated through content analysis method. The statistical population of this study was all homosexual men living in Tehran. For this purpose, among the homosexual men who participated in the seasonal meetings of this minority in Tehran, according to the purpose and nature of the research, screening test was performed with Beck Depression Inventory. Those who scored highest according to the cut-off score point were grouped into two groups of experimental and control groups with three levels of watching pornographic films including high, medium and mild, thereby totaling six groups.

The rate of using of pornography was the basis of the subject's rating at three levels of low, moderate, and high. This index was assessed by the scale of exposure to same-sex pornographic material (SEM) and the subjects were

classified non-randomly based on screening assignment in the groups. The Stages of Change Readiness and Treatment Eagerness Scale was only evaluated in two stages of pre-test and post-test, and this was not a criterion for classification of the subjects in the groups.

The change-based treatment protocol was delivered to the three experimental groups for 12 weeks with an awareness-raising approach to the health consequences of high risk sexual behavior in the form of a brochure as one-hour weekly sessions. The control group was placed on the waiting list.

Inclusion criteria comprised of having at least eighteen years of age, the minimum ability to read and write, having homosexual identity, the existence of at least one male sexual partner during the last five years, and a history of chronic dependence on methamphetamine for at least 1 year; having viewed male SEM in the past 3 months; and living in the Tehran city within 50 miles of the geographic location. Exclusion criteria were absence two sessions or more from the treatment sessions and the lack of final completion of the questionnaires in the post-test stage.

After receiving the criteria for entering the research, the participants passed the clinical interview process. They were evaluated and analyzed in two stages of pre-test and post-test. As it is known, homosexuals comprise a minority group; hence, they can be considered as a vulnerable community. Under such circumstances, informed consent for participation proves substantially more important as the possibility of being informed or lack of consent in vulnerable people is significantly lower than that of ordinary people. Informed consent in this research was obtained without any compulsion, threat, enticement, and seduction, and people's refusal to accept or continue to participate in the study was respected. Attempts were made in order for the research methods not to contradict with the religious and cultural standards of the participants. In order to observe the ethical principles, the subjects of the waiting list received 5 sessions of the stages of change treatment group after the end of the study.

Instruments:

In this study, a structured clinical interview was conducted to diagnose the drug dependency disorder DSM-IV (SCID). Moreover, a researcher-made demographics form, Beck Depression Inventory, and the Stages of Change Readiness and Treatment Eagerness Scale were used.

Structured Clinical Interviews for DSM-IV Disorders (SCID) is a clinical interview that is used to diagnose axial disorders based on DSM-IV. The reliability coefficient for SCID is reported by assessors to be 60% (17). The diagnostic agreement of this instrument in Persian was desirable for most of the specific and general diagnoses with reliability coefficients greater than 0.6. Kappa coefficients for all current diagnoses and life expectancy diagnosis have been reported as 0.52 and 0.55, respectively (18).

The researcher-made demographics form with 7 items was covered personal information such as age, education, marital status, occupation, and duration of drug use.

Beck Depression Inventory (BDI): it is a self-reported scale developed by Aaron T. Beck, a 21-item instrument often used to assess the severity of depression in adults and adolescents who are 13 years of age or older (19). Each item has a set of at least four possible responses, ranging in intensity. When the test is scored, a value of 0 to 3 is assigned to each answer to determine the severity of depression. The standard cut-off scores are: 0–9 indicating minimal depression; 10–18 indicating mild depression; 19–29 indicating moderate depression, and 30–63 indicating severe depression. Although this inventory is used to identify depression disorders, research suggests that it identifies depression symptoms below the threshold that are associated with significant psychological damage (20).

The Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES): This 19-item self-report measure was developed by Miller and Tonigan (21) to evaluate readiness to change. Each item is rated on a 5-point Likert scale. SOCRATES was originally designed to assess the eagerness of alcoholists to make a change, but today the tool is also used to evaluate addicts to other non-alcoholic drugs. This scale has several versions, including the individual drug / alcohol abuse questionnaire, which has 19 terms. SOCRATES has 3 subscales of recognition, bias, and performed actions. The subscale of *bias* indicates the doubts and uncertainties of the subjects about the existence of the problem and the damage. The subscale of *recognition* indicates the subject's awareness of the problem and his/her desire for change. The subscale of *performed actions* includes activities that the individual has done to make a change. The validity of this scale has been studied in two studies with a sample size of 34 and 208 people and has been reported to be acceptable (21).

The scale of Exposure measures to SEM: It is a class scale to assess the methods and the extent to which sexually provocative media are used. The methods are based on four options: 1) Magazines; 2) Video / DVD; 3) Internet via PC; 4) Internet via mobile. Also, the participants are asked to report the age of the first use and the usual time of using the SEM within the ninety days prior to the study onset. For this purpose, seven options are used: 1) 1-15 minutes, 2) 16-30 minutes, 3) 31-45 minutes, 4) 46-60 minutes, 5) 1-1.5 hours, 6) 1.5-2 hours, and 7) more than two hours. A clause also refers to the preferences of using a condom in the form of a sequential spectrum: 1) use, 2) non-use, and 3) lack of preference for a condom (Cronbach's alpha >0.85).

Intervention Method:

The Transtheoretical Model:

The treatment protocol was based on stages of change together with an awareness-raising approach to the health consequences of high-risk sexual behaviors. The protocol was delivered using a brochure and educational films focusing on encouraging protected sexual behavior in the course of weekly one-hour meetings. Our assumption was that the use of pornography in unprotected relationships could lead to depression in the interaction with emotional fluctuations and impulsivity. In this study, only the construct of the stages of change was considered, and other constructs such as decisional balance or processes of change were not investigated. Hence, identifying the stages of change and individual issues related to the personality is important in helping an individual. SOCRATES was used to assess the stages of change.

Statistical Analysis:

The present study aimed to evaluate the impact of a TTM-based educational intervention on symptoms of depression with the mediator of attitude to pornographic in homosexual men.

Two-factorial variance analysis was used in this study as there were the two independent variables of the interventional therapy and the rate of watching pornographic films as well as the existence of the dependent variable of depression. For this purpose, normality of the distribution, the similarity of variances, and the variance of covariance matrix as the basic assumptions of the mentioned test were evaluated by Kolmogorov-Smirnov test, Levene's test and M-Box tests. Also, the requirements for using two-way variance analysis were established. Scheffe's post hoc test was also used to evaluate subsequent

consequences. Moreover, nonparametric Chi-square test was used to study the evolution of subjects in the process of stages of change, considering the degree of classification of the scale. Our assumption was that lower levels of watching pornographic films contributes more desirably to the impact of the treatment based on stages of change. Data analysis was conducted using IBM SPSS Statistics Version 20 (IBM Corp., Armonk, NY, USA). Statistical significance was set at the level of $P < 0.01$.

3. Results

The appropriate assumptions were examined before selecting appropriate statistical test.

Kolmogorov-Smirnov test was used to test the normality of the distribution of the studied variable. This statistic was calculated equal to 0.716, which indicates that the distribution is normal. Before using parametric test of multivariate analysis of variance, in order to observe its assumptions, Levene's test and M-Box tests were used. M-Box test was not significant for any of the variables ($P=1.01$, $F=5.11$, $M\text{-Box}=7.24$). Also, the results of Wilks' Lambda showed that the effect of the group on the composition of depression and pornography components was significant ($P < 0.001$, $F=18.90$, Wilks' Lambda=0.19). Thus, the use of the variance analysis is permissible.

Demographic characteristics of participants

In Table 1, demographic characteristics of the participants are presented in terms of number of sexual partners, age, education, job status, and monthly income.

Comparing within-group difference of the distribution of the participants using Chi-square shows that most participants are significantly in the age range of 18-24. Also, participants with an income less than 200 dollars per month showed a significant difference from participants with income higher than 200 dollars per month (all P 's < 0.01).

In Table 2, mean and standard deviation of the scores of participants are presented in terms of descriptive data.

The results of Table 2 display the mean and standard deviation of the participants in terms of depression in six research groups in two stages of pre-test and post-test.

Comparison of scores through independent t-test showed a significant difference between depression scores in the experimental group in the two levels of low and moderate before and after intervention ($P < 0.01$). In order to

more accurately analyze, the variance analysis was used and the results are presented in Table 3.

The results of Table 3 show that there is a significant difference between the depression scores in combination with the moderate ($F=5.11$) and mild ($F=5.74$) pornography in the experimental group compared to the control group ($P<0.001$). In order to determine the dimensions of this difference, Scheffe's post-hoc test was used.

The results of Scheffe's test showed that TTM had a significant impact on the two depression groups with the interactive effects of moderate ($P<0.05$) and low ($P<0.01$) pornography, whereas it had no significant effect on high-pornography index ($P>0.05$).

Non-parametric chi-square test was used to examine the difference in the stages of change according to the above scale.

Table 1: Demographic characteristics of participants in the six groups

Variable	Dimensions	Experiment N=36			Control N=36		
		Depressed- high porno	Depressed- medium porno	Depressed- low porno	Depressed- high porno	Depressed- medium porno	Depressed- low porno
		N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
Number of sexual partners (last three months)	Less than 50 partners	7 (41%)	8 (59%)	7 (58%)	6 (42%)	9 (75%)	4 (33%)
	More than 50 partners	3 (58%)	4 (33%)	5 (41%)	6 (42%)	3 (25%)	8 (59%)
Education	Below diploma	9 (25%)	5 (41%)	2 (16%)	7 (58%)	3 (25%)	5 (41%)
	Above diploma	5 (75%)	7 (58%)	10 (83%)	5 (41%)	9 (75%)	7 (58%)
Age (year)	18-24	7 (41%)	6 (42%)	9 (75%)	4 (33%)	5 (41%)	8 (59%)
	>25	4 (58%)	6 (42%)	3 (25%)	8 (59%)	7 (58%)	4 (33%)
Job status	Employed	8 (33%)	6 (42%)	7 (58%)	6 (42%)	9 (75%)	10 (83%)
	Unemployed	9 (59%)	6 (42%)	5 (41%)	6 (42%)	3 (25%)	2 (16%)
Monthly income	Less than \$ 200	9 (75%)	8 (59%)	6 (42%)	9 (75%)	5 (41%)	9 (75%)
	More than \$ 300	3 (25%)	4 (33%)	6 (42%)	3 (25%)	7 (58%)	3 (25%)

Table 2: Mean and standard deviation of statistical test results

Group	Variable	Stage	Pornography index	Mean±SD
Experiment	Depression	Pre-test	Low	14.27±1.93
			Medium	13.13±2.01
			High	12.71±1.87
		Post-test	Low	10.75±1.82*
			Medium	9.27±1.12*
			High	11.94±1.66
Control	Depression	Pre-test	Low	13.97±2.24
			Medium	12.94±2.23
			High	13.01±2.12
		Post-test	Low	13.19±1.97
			Medium	12.61±2.01
			High	12.91±1.69

*: $P<0/01$

Table 3: The results of two-factorial variance analysis (ANOVA) to compare the pre-test and post-test score of depression in the three levels of pornography

Group	Source of variation	Sum of Squares (SS)	df	Mean Square (MS)	F	p-value
Experiment	High porno	711.15	5	142.23	2.64	0.08
	Medium porno	587.70	5	117.54	5.11*	0.00
	Low porno	623.10	5	124.62	5.74*	0.00
Control	High porno	339.75	5	67.95	2.27	0.89
	Medium porno	265.65	5	53.13	2.31	0.68
	Low porno	153.09	5	51.03	2.35	0.59

The results of the chi-square test to determine the evolution of the subjects in the change process showed that only the test scores with low pornography index showed a significant change compared to the pre-test ($P < 0.01$). While in the baseline assessment, 42% of the participants in the low pornography group were at the action stage, this increased to 66% in the post-test. These results show the impact of stages of change treatment in the group with a low paleographic index.

4. Discussion

This study was a quasi-experimental study aimed at assessing the impact of treatment based on the stages of change on depression among methamphetamine users at three levels of high, medium and low use of pornographic films. Our assumption was that the use of pornography is associated with an undesirable prognosis in the recovery of depression syndrome. It was also assumed that individuals with a low and moderate use of pornography would experience a more significant change in the process of stages of change.

The results of this study showed that treatment of stages of change was effective on depression as regarding the medium and low pornography indices. Also, this treatment was effective on the stages of change development in the group with a low use of pornographic films, while its impact on high and medium use of pornographic films was not significant. Although a similar study has not been conducted in this regard, the study of the etiology of the present research components can be a logical explanation for the findings of the research. Several psychological, genetic and behavioral factors can cause depression in homosexual men (22, 23). Prejudicial behaviors towards homosexuals such as defamation, self-alienation, and the experience of chronic stress can lead to depression, sexual violence, or the use of drugs to reduce tension (23). Research shows that the likelihood to commit suicide in this group is twice higher than other homosexuals (24, 25). However, little attention is paid to the process of the formation of this phenomenon.

Studies show that people who experience depressive symptoms may experience high risk behaviors to adjust their negative emotions. In line with previous research, depression syndrome has a significant relationship with unprotected sex. Men who have been involved in

unprotected sex have reported more depressive symptoms (26). The main symptoms of depression such as frustration and worthlessness can lead to decreased self-care activities, including less condom use. In fact, there is a negative correlation between negative mood and the use of condoms. Depression affects the ability to resist pressures from peers and use of safe sex practices as it reduces the sense of self-efficacy and self-confidence in the user, and due to the creation of faulty cognitive processes, the possibility of implementing secure sexual relationships would disrupt (27). Depressed teens are more likely to be affected by deviant peers; these individuals are more sexually active than non-depressed teens and they use fewer condoms (28). Basically, people who have sex with negative emotions are more likely to be involved in high risky behaviors (29). It is not surprising that depression is associated with consequences such as sexually transmitted diseases (28, 30) and pregnancy in adolescence (31, 32). From a clinical point of view, the use of pornographic films can lead to high risk sexual behaviors and the emergence of depression syndrome. Research shows that there is a significant positive correlation between the use of pornography with sexually provocation, increased masturbation, paying for sex, sexual intercourse at an early age, having oral, anal and group sex, and the transmission of sexually transmitted infections (33).

One of the aspects of the present study was to investigate the effectiveness of treatment of stages of change on the rate of watching pornographic films. The results of this study showed that this treatment could have a significant effect on the medium and low levels of pornographic watching films among the levels of high, medium and low, in patients with depression index. The research background indicates the significant effect of metatheoretical therapy on the reduction of insecure sexual behaviors (34). In the study of Gullette and Turner (34), in which the relationship between the stages of change and the rate of use of condom in homosexual and bisexual samples was examined, the participants who never used condoms in their relationship (82% of sample size) were in the pre-reflection phase. While, participants who reported condom use continuously, were in the maintenance stage. In the present study, 42% of the participants in the low pornography group were in the action stage in the baseline assessment, while in the post-test, this increased to 66%. In

this regard, it can be said that the concept of the stages of change has a high potential (accuracy of 93%) in predicting therapeutic success. In explaining the ineffectiveness of stages of change treatment on the evolution of attitudes to watching pornographic films, the researcher refers to the closeness of psychological and sociological approaches. Our assumption in the evolution of the stages of change was to shift from the tendency to use pornographic films to reduce their use in homosexuals, although some researchers believe that SEM can, in addition to negative effects, include positive effects, such as education and sexual information, understanding, and confirmation of sexual attractiveness by men in homosexual men (35-38).

5. Conclusion

The results showed that TTM has a significant impact on two depressive groups with interactive effects of moderate and low pornography, but it did not have a significant effect on high-pornography index. Discussing the symptoms of depression in homosexuals, far beyond a clinical syndrome, brings a wide range of sexual behaviors as well as cultural, individualistic and religious differences. These findings confirm the multidimensionality and the curvature of sexual behaviors of an individual. Some aspects are more complex, whereas other aspects such as drug abuse and diversity in the use of stimulating media explain part of the variance of sexual behavior, which requires controlled studies in a wider range.

The aim of this study was to explain the psychological components of depression and to link these aspects with cultural indices such as attitudes toward sexually-provoking media on the one hand and the society's different look to the context of homosexual societies. In this study, the researcher tried to go beyond the stereotypical linear explanations concerning the links between the psychiatric, clinical and cultural dimensions of the diseases, and reach an optimal explanation. Solving this fundamental challenge requires more controlled trials in the future.

The findings of this study were accompanied by several limitations. The most important of these limitations consisted of: (1) the adoption of ideological measures to have access to homosexuals was a serious obstacle; (2) the use of a self-report assessment approach in sensitive topics often tends to create a desirable social image and the possibility of bias. It is suggested that a larger sample be used in future studies in order to have a more reliable

interpretation of the population through fewer statistical errors. Also, in order to evaluate more precisely, it is desirable to use neuropsychological tools along with questionnaires. Finally, it is suggested that a similar female (homogeneous) sample be used in future studies, an indicator that we were not able to evaluate in the present study.

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