Chronic Diseases Journal

DOI: 10.22122/cdj.v8i4.548 Published by Vesnu Publications

The comparison of the effectiveness of contingency management and trans-theoretical model on the risk of sexual behaviors in cocaine users: A short report study

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Short Communication

Abstract

BACKGROUND: A transtheoretical model (TTM) can be considered as a cognitive and motivational view, a component which plays a significant role in addiction. Further, the theoretical basis of contingency management (CM) treatment is the origin of behaviorism and relies on operant conditioning. The present study is performed aiming to determine the effectiveness of TTM and CM on cocaine use and sexual risk behaviors in cocaine users.

METHODS: In this randomized clinical trial with 6-month follow-up, which was performed from 15 December 2014 to 20 November 2015, 75 male cocaine users were selected based on a respondent-driven sampling (RDS) method and were randomly divided into three groups by block randomization. The experimental group received a 12-week CM protocol and TTM and the control group was placed on the waiting list. Pre-test, post-test (after 12 weeks of training), and follow-up (six months) were administered. Data analysis was carried out using repeated measures analysis of variance (ANOVA), Scheffe's post hoc test, and chi-square test through SPSS software.

RESULTS: The mean age of the CM group, TTM group, and control group was estimated 26.12, 25.31, and 23.91, respectively. The primary outcome showed that CM and TTM had a significant effect on decreasing the sexual thoughts, sexual hyperactivity, and high risk behaviors. This effectiveness was stable until six months (P = 0.008), however there was not a significant difference between the two treatments (P = 0.200). The secondary outcome showed that in the changing stages, TTM (F-72%) and CM (F-60%) had a significant effectiveness which maintained until the follow-up stage.

CONCLUSION: The findings more enhance the hope to integrate the theoretical approaches into the clinical interventions.

KEYWORDS: Cocaine; Dangerous Behavior; Behavior Therapy

Date of submission: 02 July 2019, ***Date of acceptance:*** 12 Sep. 2019

Citation: Panahi M, Honarvar T, Sadegh-Esfahani N, Salari-Moghadam L, Salari-Moghadam S, Jamali R, et al. **The comparison of the effectiveness of contingency management and trans-theoretical model on the risk of sexual behaviors in cocaine users: A short report study.** Chron Dis J 2020; 8(4): 197-200.

Introduction

Cocaine is a highly addictive drug that increases the level of alertness, attention, and energy.[1] It is made of the coca plant, which is native to South America. Cocaine consumption can cause structural and hormonal changes in the brain that can lead to high risk behaviors.[2,3] Individuals who have an experience of cocaine use report increased feelings of alertness, energy, sociability, and emotional expressiveness. The use of cocaine has been associated with risky sexual behaviors,

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indicating its clinical importance.

One of the emerging therapies with clinical trials that are tested in the field of drug abuse is contingency management (CM). CM in the form of using secondary positive reinforcers, such as coupons, goods and services. CM has reported promising results in the treatment of methamphetamine and cocaine abuse.[4] CM has also been effective in reducing the high risk sexual behavior associated with human immunodeficiency virus (HIV). Shoptaw et al.[5] showed that CM was able to produce similar effectiveness to cognitive-behavioral therapy in reducing the high risk sexual behavior in methamphetamine users.

On the other hand, transtheoretical model (TTM) was developed by Prochaska et al. with the goal of designing smoking cessation therapy.[6]

Regarding the increasing prevalence of cocaine use among young people and the high risk of transmission of HIV to cocaine users, and according to the effectiveness of CM and TTM in the addiction area, the present study was performed with the aim to evaluate the effectiveness of TTM and CM on cocaine use and sexual risk behaviors in cocaine users.

Materials and Methods

The present study was a randomized clinical trial with 6-month follow-up. The population of the study included all male cocaine users who lived in Tehran, Iran. The study data were collected from 15 December 2014 to 20 November 2015, using a respondent-driven sampling (RDS) method.[7,8] 75 participants were randomly assigned into three groups by block randomization method.[9] The experimental group received a 12-week CM protocol and TTM and the control group was placed on the waiting list. The Data Matching Software was employed for data cleansing, standardization, matching, and record merging.

Coupon was allocated for negative urine samples (urine without cocaine). The rewards for the negative urine testing were $1, $3, and 5$ for the first, second, and third samples, respectively, and at subsequent stage, a further $1.25 was added to the coupon values.

After 12 treatment sessions based on the CM and TTM, all participants in the study were evaluated by the Sexual Behavioral Inventory and the Stages of Change Readiness Scale. The data were analyzed using analysis of variance (ANOVA), Scheffe's post hoc test, and chi-square test in SPSS software (version 20, IBM Corporation, Armonk, NY, USA).

All stages of the study were carried out after obtaining informed consent and based on the latest version of the Declaration of Helsinki (DoH) [with the Iranian Registry of Clinical Trials (IRCT) code: TRCT20180329002).

Results

The demographic status of the participants in the study is presented in table 1. Additionally, the mean age of the CM group, TTM group, and control group was estimated 26.12, 25.31, and 23.91, respectively (P > 0.080).

The results of the repeated measures ANOVA showed that both treatment approaches were effectiveness on all three subscales of sexual thoughts, sexual hyperactivity, and high risk behaviors (P < 0.010 for all).

Table 1. Demographic information of the study participants

Variables	Level	CM (n = 25)	TTM (n = 25)	Control (n = 25)	P
Education [n (%)]	Lower than diploma	9 (36)	11 (44)	8 (32)	0.037
	Higher than diploma	16 (64)	14 (56)	17 (65)	
Age (years) [n (%)]	18-25	17 (68)	16 (64)	15 (60)	0.043
	Above 25	8 (32)	9 (36)	10 (40)	
Occupation status [n (%)]	Employed	19 (76)	15 (60)	14 (56)	0.046
	Unemployed	6 (24)	10 (40)	11 (44)	
Monthly income [n (%)]	Less than one million Tomans	15 (60)	14 (56)	13 (52)	0.049
	More than one million Tomans	10 (40)	11 (44)	12 (48)	

For assessment of the difference among the sexual thoughts, sexual hyperactivity, and high risk behaviors, the Scheffe's post hoc test was used. The results revealed that there were significant differences between the mean values of precontemplation, ccontemplation, preparation, action, maintenance, termination in sexual thoughts, sexual hyperactivity, and high risk behaviors ($P < 0.010$). But there was no significant differences between the two treatment groups ($P > 0.200$).

The results of the chi-square test to compare the difference of groups in the key component of the change stages (precontemplation, ccontemplation, preparation, action, maintenance, termination) showed that TTM (F-72%) and CM (F-60%) had a significant effectiveness, which was stable until the follow-up stage.

Discussion

The findings showed that both treatment approaches were effective on sexual thoughts, sexual hyperactivity, and high risk behaviors. TTM also produced significant efficacy on the change stages in the above therapy group. On the other hand, CM had a significant effect on reducing cocaine use.

Consistent with our findings, the results of the study by Higgins et al.[10] showed that CM could lead to an increased avoidance period for cocaine users, and the duration of avoidance to follow-up lasted to 6 months. Our findings are in contradiction with the results of the study by Heil et al.[11] They found that the effectiveness of CM on simultaneous consumers of cocaine-alcohol was similar to that of control. Compared with the current study, nonalcoholic cocaine-dependent subjects and codependent patients exhibit a wider array of problems, many of which merit professional attention. Alcoholic cocaine-dependent subjects may require extra treatment efforts for successful outcomes.

In contrast, the study by Rash et al.[12] showed that CM treatment has been effective in drinking cocaine users. The methodological and demographic differences as contradictory in the findings can be regarded important. Our findings contradict the results of Killeen et al.[13] who examined the efficacy of CM with community-based standard therapies in marijuana consumers. In this regard, new studies have shown that marijuana consumption affects psychological indicators such as delay discounting and reinforcement sensitivity.[14,15] Moreover, the results of the study by Pirnia et al.[16] indicated that CM has been effective in cocaine craving, but did not have a significant effect on increasing negative urine test of the stimulant.

One of the findings of this study is the effect of CM on the reduction of high risk sexual behaviors. In line with our findings, the study by Higgins et al.[17] suggested that participation in cocaine abuse treatment programs leads to a reduction in risky sexual behaviors. These results systematically replicate and extend the prior findings that the availability of alternative, nondrug reinforcers can significantly decrease cocaine use.

This study was an attempt to indirectly compare two main paradigms in the field of clinical psychology and behavioral approach in the form of CM and cognitive approach in the form of a TTM. It is suggested that consideration be given to savings on potential costs in CM in future studies.

This study had some limitations. The most important limitation was that because of security and legal issues, paying in cash was not performed immediately, but late at night through paying on-line.

Conclusion

Based on the results of the present study, CM and TTM had a significant effect on the increase in using condoms. This effectiveness lasted for six months in the follow-up period. These findings can be applied to the acceptance and implementation of CM and

TTM as an evidence-based approach.

Conflict of Interests

Authors have no conflict of interests.

Acknowledgments

The authors would like to appreciate all people who participated in this study and helped to facilitate the research process. This article resulted from an independent research without any financial support.

References

1. Pirnia B, Soleimani AA, Tavallaii A, Roshan R, Pirnia K. Two New Therapies in the Cocaine-dependents: Comparison of Topiramate and Contingency Management. Iran J Public Health 2018; 47(10): 1607-8.
2. Pirnia B, Givi F, Roshan R, Pirnia K, Soleimani AA. The cortisol level and its relationship with depression, stress and anxiety indices in chronic methamphetamine-dependent patients and normal individuals undergoing inguinal hernia surgery. Med J Islam Repub Iran 2016; 30: 395.
3. Pirnia B, Moradi AR, Pirnia K, Kolahi P, Roshan R. A Novel Therapy for cocaine dependence during abstinence: A randomized clinical trial. Electron Physician 2017; 9(7): 4862-71.
4. Peirce JM, Petry NM, Stitzer ML, Blaine J, Kellogg S, Satterfield F, et al. Effects of lower-cost incentives on stimulant abstinence in methadone maintenance treatment: A National Drug Abuse Treatment Clinical Trials Network study. Arch Gen Psychiatry 2006; 63(2): 201-8.
5. Shoptaw S, Klausner JD, Reback CJ, Tierney S, Stansell J, Hare CB, et al. A public health response to the methamphetamine epidemic: The implementation of contingency management to treat methamphetamine dependence. BMC Public Health 2006; 6: 214.
6. Prochaska JO, DiClemente CC, Norcross JC. In search of how people change. Applications to addictive behaviors. Am Psychol 1992; 47(9): 1102-14.
7. Pirnia B, Pirnia K, Aghajanpoor M, Mardan F, Zahiroddin A. Relationship between function of hypothalamic-pituitary-adrenal axis and executive functions in chronic methamphetamine users: A cross-sectional study. Asian J Psychiatr 2018; 35: 113-4.
8. Pirnia B, Pirnia K, Mohammadpour S, Malekanmehr P, Soleimani A, Mahmoodi Z, et al. The effectiveness of acupuncture on HPA functional in depressed patients under methadone maintenance treatment, a randomized double-blind sham-controlled trial. Asian J Psychiatr 2018; 36: 62-3.
9. Pirnia B, Soleimani AA, Malekanmehr P, Pirnia K, Zahiroddin A. Topiramate for the treatment of dually dependent on opiates and cocaine: A single-center placebo-controlled trial. Iran J Public Health 2018; 47(9): 1345-53.
10. Higgins ST, Budney AJ, Bickel WK, Foerg FE, Donham R, Badger GJ. Incentives improve outcome in outpatient behavioral treatment of cocaine dependence. Arch Gen Psychiatry 1994; 51(7): 568-76.
11. Heil SH, Badger GJ, Higgins ST. Alcohol dependence among cocaine-dependent outpatients: Demographics, drug use, treatment outcome and other characteristics. J Stud Alcohol 2001; 62(1): 14-22.
12. Rash CJ, Alessi SM, Petry NM. Cocaine abusers with and without alcohol dependence respond equally well to contingency management treatments. Exp Clin Psychopharmacol 2008; 16(4): 275-81.
13. Killeen TK, McRae-Clark AL, Waldrop AE, Upadhyaya H, Brady KT. Contingency management in community programs treating adolescent substance abuse: A feasibility study. J Child Adolesc Psychiatr Nurs 2012; 25(1): 33-41.
14. Koffarnus MN, Kaplan BA. Clinical models of decision making in addiction. Pharmacol Biochem Behav 2018; 164: 71-83.
15. Amlung M, Vedelago L, Acker J, Balodis I, MacKillop J. Steep delay discounting and addictive behavior: A meta-analysis of continuous associations. Addiction 2017; 112(1): 51-62.
16. Pirnia B, Soleimani A, Taherinakhost HR, Pirnia K, Malekanmehr P, Zahiroddin A. A randomized pilot trial of contingency-management intervention for patients in during methadone maintenance treatment, cash vs. vouchers. Iran J Public Health 2018; 47(4): 618-9.
17. Higgins ST, Bickel WK, Hughes JR. Influence of an alternative reinforcer on human cocaine self-administration. Life Sci 1994; 55(3): 179-87.