ORIGINAL ARTICLE

EVALUATING THE EFFICACY OF COGNITIVE BEHAVIOURAL THERAPY FOR AMPHETAMINE USE DISORDER: IMPACT OF SOCIO-DEMOGRAPHIC AND BEHAVIOURAL FACTORS IN PAKISTAN

Abrar Hussain Azad[1]✉, Ijaz Ali[2], Farhan Nazir[3], Muhammad Usman Anjum[2], Muhammad Ali Raza[2], Ahmed Azeem Dar[2], Shaaray Abrar Umar[4], Pashma Wazir[5]

[1]Health Services Academy Islamabad-Pakistan, [2]Mohi ud Din Islamic Medical College Mirpur-AJK, [3]Pak Emirates Military Hospital Rawalpindi-Pakistan, [4]Capital Hospital Islamabad-Pakistan, [5]Ali Medical Center, Bara Kahu, Islamabad-Pakistan

Background: Amphetamine use disorder (AUD) is a public health concern on a global scale and is a rising epidemic in Pakistan. Cognitive Behavioural Therapy (CBT) is a well-established treatment for substance use disorders, but its efficacy may be dependent on what is known as socio demographic and behavioural variables. The aims of this study are to provide evaluation of efficacy of CBT for AUD in Pakistani population and to find whether the presence of factors like education, job, duration of addiction, residence, age, family support, smoking and alcohol intake may affect treatment outcomes. **Methods:** A quasi-experimental design was applied with 100 participants recruited from outpatient treatment centers and rehabilitation centers in Pakistan. A culturally adapted CBT program was delivered to 50 participants along with treatment as usual and standard treatment as usual (TAU) was given to control group with 50 participants. Addiction Severity, anxiety, depression, psychological wellbeing, quality of life, as well as relapse rates were measured using pre-test and post-test assessments. Descriptive statistics, paired t-tests, ANOVA, multiple regression and survival analysis were completed to analyze the data. **Results**: The frequency of amphetamine use from pre to post change from 5.8 to 2.3 days per week (p<0.001) and ASI, addiction severity index scores from pre to post change from 30.2 to 18.7 (p<0.001) was significant in the CBT group. On the behavioural as well as on the psychological measures, improvements were observed, as evidenced by a decrease in the BDI from 22.4 to 14.1 (p<0.001) and a decrease in the GAD-7 from 18.5 to 11.3 (p<0.001). Significantly higher Quality of Life (WHOQOL-BREF) scores improved from 45.3 to 62.0 (p<0.001). But the TAU group also got better, just not as much as the CBT group. Positive associations were found with socio-demographic factors (such as higher education, stable employment and strong family support) and negative associations with unemployment, longer duration of addiction and regular alcohol intake. **Conclusion:** Both the effectiveness of CBT and its suitability to reduce amphetamine use, enhance psychological wellbeing, and improve quality of life among individuals with AUD in Pakistan were demonstrated. The significance of incorporating social demographic factors, and behavioural factors in the development of CBT interventions to ensure maximal treatment effect is underscored.

Keywords: Amphetamine Use Disorder; Cognitive Behavioural Therapy; Behavioural Factors; Socio Demographic Factors; Pakistan; Substance Use Treatment

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INTRODUCTION

Worldwide there is a growing recognition of amphetamine use disorder (AUD) as a significant public health problem. There is high prevalence in Pakistan. In the category of most potent central nervous system stimulants, amphetamines carry the high risk of severe dependence and multiple adverse health consequences. An assessment of the rising trend of amphetamine misuse in Pakistan seeks an urgent demand for accurate treatment and strategies. Although the effectiveness of Cognitive Behavioural Therapy (CBT) has been shown to be contingent upon a number of socio-demographic and behavioural factors, CBT is an emerging intervention for substance use disorders. This study, aims at assessing the efficacy of CBT in Pakistan for AUD with an aim that it could examine the factors like education level, profession, duration of addiction, rural vs. urban residence, age, family support, smoking and a use of alcohol as factors that could affect the treatment efficacy. Stimulant drugs amphetamines work by increasing the levels of neurotransmitters (dopamine and norepinephrine) released causing a feeling of alertness, euphoria, and energy.[1] Although chronic use can make one psychologically and physiologically dependent. Research studies[2] have proven that the misuse of amphetamines has direct effects on multiple systems in human body such as heart and arterial system, mental health, brain function etc. Amphetamine

use in Pakistan, particularly among the youth and the people of the urban centers is a matter of great concern, and needs effective treatment interventions.[3] The use of CBT as psychological intervention for substance use disorders is well established.[4] This is a structured series of sessions where people learn to find and refute hazardous cognitive distortions, to create coping systems, and adapt behaviour changes to lessen substance use and forthcoming relapse.[5] Many Studies have shown the effectiveness of CBT in at least some forms of substance use disorders including alcohol and cocaine dependence.[6] Forty studies of CBT for amphetamine use disorder have demonstrated reduced drug use and improved psychological functioning overall, although the treatment outcome was moderate.[7] The effectiveness of CBT depends on socio-demographic and behavioural factors. Previous studies showed that education level plays a role in treatment outcomes, with higher education level often accompanied by better engagement and adherence to therapy.[8] Treatment access and efficacy may also be affected by profession and socio-economic status; one example is that people with jobs and higher income may be better resourced to support their recovery.[9] Among the many factors that influence treatment success, time duration of addiction is important since research shows that longer history of substance use contribute to more entrenched behaviours and more severe addiction.[10] On the other hand, treatment outcomes are affected by geographical residence; rural areas frequently lack access to specialized treatment services and social support, which are available in urban settings[11] Due to striking differences between urban and rural areas, there are other problems, including higher grades of exposure to substance use triggers and stressors[12] Another important factor is age, as for instance, younger people might not deal with treatment challenges in the same way as older adults do. This is because developmental stages and experiences in life vary.[13] A major component of successful treatment is family support again a major component of therapy.[14] Measures to reduce drinking and smoking during addiction treatment can prove to be crucial for the utility of CBT in the management of amphetamine dependence and, ultimately, the success of treatment.[15] In this study we aim to contribute to the understanding of CBT's effectiveness for AUD in Pakistan by investigating how socio-demographic and behavioural factors influence treatment outcomes. The aim of the research is to increase our understanding of how to adapt CBT to better suit the particular needs of individuals with AUD to eventually improve treatment and outcome.

MATERIAL AND METHODS

A quasi-experimental design was used to evaluate the effectiveness of Cognitive Behavioural Therapy (CBT) for Amphetamine Use Disorder (AUD) and to explore the determinants for this outcome, using a number of socio demographic and behavioural factors. AUD symptoms and related outcomes were assessed before and after the intervention with pre-test and post-test assessments. The participants were recruited from two outpatient treatment facilities and two other rehabilitation centers in Pakistan. The sample size was 100. a Purposive sampling method technique was applied, to select as the participants.

Adults with amphetamine use disorder, 18-65 years of age, based upon DSM-5 criteria for amphetamine use disorder, willing to participate in the study and complete CBT, without severe co-occurring psychiatric disorders (e.g., psychosis, severe bipolar disorder)

Persons with severe medical conditions of such nature and interfering to the extent that they could not participate or get involved in specialist mental treatment procedure. Participants were involved in a culturally adapted CBT program that had been structured especially for the treatment of substance use disorders. Standard treatment as usual (TAU) consisted of general counselling plus routine medical care such as detoxification. The control group of 50 participants received TAU, while experimental arm of 50 participants received CBT intervention along with TAU. This made it possible to compare the results of the CBT group with the control group to figure out the potential added benefit of CBT. Independent variables included education level (classified into groups such as unemployed, skilled labour, professional, and others), duration of addiction (measured in years of amphetamine use), residence (rural or urban, measured according to participants living areas), age (expressed in age brackets, e.g., 18–30, 31–45, 46–65), family support as measured by a validated scale of perceived family support, smoking status (non-smoker, current smoker, former). Dependent variable like Severity of amphetamine use was measured using Addiction Severity Index (ASI) and validated self-report measures of amphetamine use frequency and quantity, psychological wellbeing was measured by Beck Depression Inventory (BDI) and General Anxiety Disorder 7 (GAD 7 scale), quality of life was measured by World Health Organization Quality of Life- Brief Form (WHOQOL-Bref) questionnaire and relapse rates were computed based on self-reports and clinical ratings at follow up visits. Assessments were done before the commencement of CBT intervention. Structured interviews were conducted to confirm AUD diagnosis and get socio demographic and behavioural information. Questionnaires (ASI, BDI, GAD-7 and WHOQLOLBREF) and behavioural assessments of smoking and alcohol intake patterns were applied. The post treatment assessments were conducted 1 week after the CBT program and again at 6 months follow up. Substance use monitoring was by urine toxicology screens for substances, self-reported frequency of amphetamine use, psychological and quality of life evaluations using the same measures

used in the pre-treatment assessments. Relapse tracking was done using self-reports and clinical interviews. Descriptive statistics, conditional descriptive statistics and comparisons of pre versus post treatment between and within the CBT and control groups were achieved through quantitative analysis using SPSS; multiple regression analysis to determine the effect of socio-demographic and behavioural factors on treatment outcome, controlling for potential confounders. Survival analysis of relapse rates and time to relapse between the CBT and control groups was studied. The qualitative analysis addressed participants that were interviewed to obtain feedback on CBT experience, and this was followed by thematic analysis identifying the themes and patterns of treatment experiences and perceived effectiveness.

RESULTS

The purpose of this research was twofold: to assess CBT for Amphetamine Use Disorder (AUD) and to investigate the moderating factors that may influence treatment outcomes. The study targeted 100 patients, out of whom, 50 patients received CBT and TAU and the other 50 patients received TAU only. Measurements were made prior to receiving active treatment and after completion of the active treatment phase, and at 6 months after active treatment completion.

Table-1: Participant Demographics

Variable	CBT Group (n=50)	TAU Group (n=50)	Total (n=100)
Age (years)			
18–30	15	14	29
31–45	22	23	45
46–65	13	13	26
Gender			
Male	35	36	71
Female	15	14	29
Education Level			
No Formal Education	5	6	11
Primary Education	12	15	27
Secondary Education	18	19	37
Higher Education	15	10	25
Profession			
Unemployed	10	11	21
Skilled Labor	18	20	38
Professional	17	15	32
Other	5	4	9
Residence			
Urban	30	29	59
Rural	20	21	41
Family Support			
Low	10	12	22
Moderate	25	23	48
High	15	15	30

Table-2: Pre- and Post-Treatment Comparison for CBT and TAU Groups

Measure	CBT Group Pre-Treatment	CBT Group Post-Treatment	TAU Group Pre-Treatment	TAU Group Post-Treatment
Frequency of Use (days/week)	5.8±1.2	2.3±1.1	5.9±1.3	4.8±1.4
Addiction Severity Index (ASI)	30.2±6.5	18.7±5.2	29.8±6.7	24.3±7.0
Beck Depression Inventory (BDI)	22.4±4.8	14.1±4.2	23.1±5.0	20.5±4.9
General Anxiety Disorder-7 (GAD-7)	18.5±5.1	11.3±4.7	19.0±5.3	16.0±5.2
Quality of Life (WHOQOL-BREF)	45.3±7.1	62.0±8.3	44.7±7.5	50.2±8.1

Table-3: Regression Analysis of Factors Influencing CBT Effectiveness

Variable	Coefficient (β)	Standard Error	t-Value	p-Value
Education Level				
No Formal Education	-3.4	1.2	-2.83	0.005
Primary Education	-2.2	1.0	-2.20	0.028
Secondary Education	-1.5	0.9	-1.67	0.097
Higher Education	0.5	1.1	0.45	0.654
Profession				
Unemployed	-2.8	1.3	-2.15	0.033
Skilled Labor	-1.8	1.1	-1.64	0.102
Professional	-1.2	1.0	-1.20	0.232
Duration of Addiction	-0.7	0.3	-2.33	0.021
Residence				
Urban	2.1	1.2	1.75	0.082
Rural	-2.1	1.3	-1.62	0.105
Family Support				
Low	-3.2	1.2	-2.67	0.008
Moderate	-1.5	1.0	-1.50	0.135
High	0.5	1.1	0.45	0.652
Smoking Status				
Current Smoker	-2.0	1.2	-1.67	0.097
Former Smoker	-0.8	1.1	-0.73	0.464
Alcohol Intake				
Occasional Drinker	-1.5	1.0	-1.50	0.135
Regular Drinker	-2.5	1.2	-2.08	0.039

Mean frequency of amphetamine use was decreased significantly from 5.8 days per week (SD=2.1 days per week) to 2.3 days per week (SD=1.5 days per week) in the CBT group (p<0.001). Addiction severity was decreased from 30.2 to 18.7 (p<0.001) as measured by the Addiction Severity Index (ASI) scores. Significant improvement was observed for psychological measures (e.g., decreases in Beck Depression Inventory [BDI] and General Anxiety Disorder 7 [GAD 7] scores; p<0.001 for both). Quality of Life (WHOQOL-BREF) scores increased significantly from 45.3 to 62.0 (p<0.001) and the TAU group also showed improvements, but the changes were less important than in the CBT group. Amphetamine use frequency decreased from 5.9 to 4.8 days per week (p≤0.01) and ASI scores from 29.8 to 24.3 (p<0.01). The CBT group showed superior improvement on psychological and quality of life measures, however the differences were generally smaller relative to the control group. Education Level: Better treatment outcomes were associated with higher education, while this effect was significant only among those with neither formal education (p=0.005) or only primary education (p=0.028). Profession: Results indicate that unemployment decreased treatment outcomes, with significant decrease in effectiveness (p=0.033). Less impact was placed on the status of professional and skilled labour.

Duration of Addiction: Treatment effectiveness was also negatively affected by a longer duration of addiction (p=0.021), which poses a challenge for people involved in a lengthy history of substance use. Residence: However, there was not a statistically significant difference between ASI improvement among rural and urban residents (p=0.082). Family Support: Finding among treatment outcomes – high family support was significantly associated with better (p=0.008) treatment outcomes, underscoring the importance of family involvement in treatment process. Smoking and Alcohol Intake: More significant effects of regular alcohol intake (p=0.039) were found.

DISCUSSION

This study gives a comprehensive detail of the treatment effectiveness of Cognitive Behavioural Therapy (CBT) for Amphetamine Use Disorder (AUD) and the significant influence of different socio-demographic and behavioural factors on treatment outcomes. The results provide important insights on how CBT could be optimized for the treatment of AUD in the context of Pakistan and show that a tailored approach is necessary to suit the needs of the diverse population in Pakistan. This matches with former research that shows CBT leads to reductions in substance use and better functioning.[16,17] Additional confirmation of the effectiveness of CBT for alleviating the seriousness of addiction comes in the form of a significant decrease in Addiction Severity Index (ASI) scores in CBT participants (from 30.2 to 18.7). It was also shown that CBT resulting in significant reductions in Beck Depression Inventory and General Anxiety Disorder-7 scores. Consistent with the literature, we find these findings in line with the notion that cognitive distortions can be addressed and improving healthy coping mechanisms can help reduce co-morbid psychiatric symptoms.[18-20] In addition, the CBT groups had better Quality of Life scores (WHOQOL-BREF) than the control groups[21], demonstrating that life satisfaction benefits are facilitated by CBT. Quality of life is an important variable for AUD patients. It turns out that those with more education tend to get more out of CBT, but only for those at the extreme ends — with no formal education and primary education — did statistically significant improvements. Educational attainment related to ability to engage and adhere to CBT principles. Other studies in the past have also shown that the more education you have the better the outcomes of treatment.[22,23] Nevertheless, the lack of much of an effect observed among people who are educated could be because education by itself does not mean the presence of supportive resources or stable living. Unemployment is a massive negative factor affecting CBT outcomes with those who are unemployed showing less improvement than those who are employed or working in professional jobs. The finding highlights the problems that people with unstable jobs face financial stress and a lack of social support that can interfere with treatment progress. There is some correlation between socio economic stability and employment status, and both affect treatment and therapeutic activities.[24] Consistent with the premise that longer histories of substance use can result in more entrenched behavioural patterns and greater severity of addiction[25], reduced treatment effectiveness was found in these analyses associated with longer histories of amphetamine use. This supports research that addictive behaviours and cognitive distortions are deep seated and have histories of extended substance use complicating the effort to treat.[26] Urban residents, however, displayed a trend for improvement of ASI scores better than rural residents, but no statistically significant difference was found. As in the developed countries, it has been suggested that the urban areas usually provide better access to specialized treatment services and support networks leading to more favourable treatment outcomes.[27] The lack of a significant difference suggests, however, that improved substance use treatment infrastructure and support are urgently needed in rural areas, where access to care can be more limited.[28] Overall,

significantly better treatment outcomes were linked to greater family support. All this substantiates the importance of family in recovery. Family support increase motivation and compliance with treatment. These findings are consistent with literature reviewing the role played by the family in client's success with the treatment of the substance use disorder.[29] Less improvement was seen among current smokers and regular drinkers than non-smokers and occasional drinkers. The finding is in agreement with research suggesting that comorbid substance use may intensify AUD treatments and hinder therapeutic progress.[30] This underscores the importance of integrating different approaches of treatment for substance use disorders at the same time

CONCLUSION

CBT showed pronounced efficacy compared to standard treatment as usual (TAU): for reduction of amphetamine use, better psychological well-being and better quality of life. Higher education levels, stronger family support, or being a non-smoker, were associated with greater treatment outcomes. Unemployment, longer periods of drug addiction duration and everyday drinking of alcohol were negatively associated with treatment effectiveness. In light of these findings, emphasis is made on the need of the targeted CBT interventions and focusing on socio demographic and behavioural factors to treat Amphetamine Use Disorder in Pakistan. To confirm these findings and refine treatment for AUD, future research with larger, more genetically and phenotypically diverse samples is needed.

AUTHORS' CONTRIBUTION

Authors have the following contributions in the present article: AHA, IA, SAU and PW prepared data collection instruments. AAD and MAR collected data for the study. FN and MUA wrote Introduction and Methods sections for respective manuscript. AHA finally prepared the results, reported and discussed. IA reviewed the manuscript. All authors approved the final manuscript.

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Address for Correspondence:

Dr. Abrar Hussain Azad, PhD Scholar at Health Services Academy Islamabad-Pakistan
Email: drabrarumar@yahoo.com