

# Behavioral Modification Program (BMP): Role of Socio-Demographic Characteristics of Adult Drug Abusers in Saudi Arabia

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## Abstract

This study shows a Behavior Modification Program (BMP) designed specifically to deal with adult drug abuser in Saudi Arabia. BMP involves multi-stage process in which successively more difficult behaviors are attained and maintained on reinforcement while drug-related behaviors are progressively reduced. The results of this program are compared against control group. Compared to control group, BMP group had higher mean age, more years of education and higher percentage of separated, divorced and widows. Only 27.7% of the study group and 44.5% of the control group were employed. The great majority of both groups were current smokers. 52.4% of study group had at least one co-morbid disease, compared to 30.3% in the control group ( $P < 0.001$ ); they also had significantly higher rates of tuberculosis ( $p = 0.004$ ), and anti-HCV ( $p < 0.001$ ). The percentages of all drugs were higher among patients in the study group; amphetamine, cannabis, and alcohol had the highest percentage in both groups. Significant effects were achieved on all criteria over control group. The behavior modification approach described is offered as a viable alternative to traditional probation methods.

**Keywords:** Behavioral modification program; Socio-demography; Drug abuse; Saudi Arabia

## Introduction

Addiction is the use of a substance, such as alcohol or another drug, to the point where a person develops a physical or psychological need for it. It is defined as repeated failures to refrain from drug use despite prior resolutions to do so [1,2]. Dependence is a state in which a person requires a steady concentration of a particular substance to avoid experiencing withdrawal symptoms. Addiction is a harmful habit that is out of control [3]. A wide range of substances can be abused. The most common classes include opioids, including such prescription pain killers as morphine and demerol, as well as illegal substances such as heroin; benzodiazapines and sedatives; stimulants; cannabinoid drugs as marijuana and hashish; cocaine-based drugs; hallucinogenic drugs; inhalants; alcoholic drinks; and cigarettes, cigars, and other tobacco products [4,5].

Substance abuse is an enormous worldwide public health problem. The extent of worldwide psychoactive substance use is estimated at 2 billion alcohol users, 1.3 billion smokers and 185 million drug users [6]. The negative consequences of drug abuse affect not only individuals who abuse drugs but also their families and friends, various businesses, and government resources, although many of these effects cannot be quantified [7,8]. The most obvious effects of drug abuse include ill health, sickness and ultimately, death [9]. Treatment includes a spectrum of options representing differences in setting, types and range of services, and intensity of service use and delivery [10]. The goal of treatment is to place the patient in the appropriate level of care; that is, to provide the specific services needed by each patient, at the appropriate level of intensity, within the appropriate setting. It may involve outpatient treatment, intensive outpatient treatment, medically monitored intensive inpatient treatment, and medically managed intensive inpatient treatment. Treatment approaches include relapse prevention treatment, the matrix model, supportive-expressive psychotherapy, individualized drug counseling, motivational enhancement therapy, behavioral therapy for adolescents, multidimensional family therapy (MDFT) for adolescents, multisystemic therapy (MST), and combined approaches. The most common kinds of treatment programs include outpatient drug-free programs, long-term residential program, and short-term inpatient programs [11,12]. Cognitive-behavioral therapy

(CBT) is a type of counseling aimed at teaching the client how to become healthier and experience a more satisfying, fulfilling lifestyle by modifying certain thought and behavior patterns. It is based on the theory that thought and behavior can affect a person's symptoms and be an obstacle to recovery. CBT can be helpful in treating a variety of problems, including depression, anxiety and panic disorders, dealing with life event such as: death, divorce, disability, unemployment, issues with children and mounting stress [13,14].

A behavioral modification program unit had been adopted in Al-Amal hospital in Jeddah since its start in 1987. It is considered as one of the most crucial interventions undertaken in the treatment of drug abusers. In addition of being a topic of interest for the researcher, up to the researcher best knowledge, no assessment was done for the effect of admission in this unit on the prognosis of drug abusers. Estimation of proper length of stay in the unit will take a part. Therefore, the aim of this study was to participate in hospital program assessment and to share in decreasing the prevalence of relapse rate, through making recommendations regarding BMP treatment protocol; and to assess the prognosis of drug abusers admitted in the behavioral modification program unit at Al-Amal hospital in Jeddah governorate for one year. Finally, the study would help hospital administration in decision-making regarding the program protocol.

## Subjects and Methods

### Study area and research design

This study was done in the Jeddah governorate, in the Kingdom of Saudi Arabia. It is located in Al-Naeem district, one of the northern

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districts of Jeddah. A historical prospective record-based study design was used, where patients were identified from the records of Al-Amal Male Hospital. The study group consisted of those patients exposed to Behavioral Therapy Program (BMP). The treatment program used is a Modified Minnesota Program. BMP is the next step after detoxification treatment. It accepts those patients who are motivated for the long-term program. The program involves psychiatric, psychological, social, and spiritual counseling, as well as family therapy, in addition to sports activities and work therapy.

**Sample characteristics:** The study population includes addict male patients (n=401) exposed to a similar treatment program. Those patients admitted to BMP who requested discharge during the orientation period, i.e. after 72 hours were excluded from the sample. The control group is a sample (n=336) from newly treated male adults addicts who were admitted to the same hospital during the same period and not involved in BMP. Sample size was calculated using PS-Power and Sample Size Calculation Software [15].

**Data collection:** A special form for data abstraction was generated and reviewed by experts for suitability and completeness. The form was designed to provide data to help in assessment of prognosis of BMP among drug abusers. The DSM-IV criteria were used regarding the main study outcome: sustained remission: abstinence for one-year forward [16].

**Ethical considerations:** The researcher took all the required steps for obtaining official permissions to access data (ethical approval No. 1424/21). No direct contact with patients took place as the study was record-based. Total confidentiality of any obtained information was secured. Any obtained information was only used for research purposes.

**Statistical analysis:** Data analysis was done using SPSS 20.0 statistical software package. Quality control was done at the stages of coding and data entry. Statistical description was done using frequencies, percentages for qualitative variables; and means ( $\pm$  SD) for quantitative variables. Inferential statistical analysis was performed according to the characteristics of the data. Quantitative continuous data were compared using Student's t-test, ANOVA and non-parametric Kruskal-Wallis test. Qualitative variables were compared using Chi-square and Fisher exact tests. Statistical significance was considered at p-value <0.05.

## Results

Table 1 presents a comparison of the socio-demographic characteristics of patients in the study (BMP) and control groups. It indicates statistically significant differences between the two groups in all displayed data. As the table shows, the mean age of the control group was lower, 29.1  $\pm$  8.0 years, compared to 31.9 $\pm$ 8.4 years in the study group. They had less years of education, compared to the study group, 8.5  $\pm$  3.2 and 9.3  $\pm$  3.1, respectively. As regards marital status, the study group had a higher percentage of separated, divorced and widows (12.0%), compared to 4.1% in the control group. The two groups were also significantly different in their job status, where about one-fourth of the study group members were working (27.7%), and compared to about half of the control group (44.5%).

The smoking status of patients in the two groups is described in Table 2. It is evident that the great majority of both groups were current smokers, with no statistically significant difference. However, the mean number of smoking years was higher in the study group, and the difference was statistically significant (P<0.001).

Figure 1 displays a comparison of the presence of co-morbid physical conditions among patients in the study and control groups. It shows that more than half of BMP patients (52.4%) had at least one co-morbid physical condition, compared to less than one-third (30.3%) of patients in the control group, and the difference was statistically significant (P<0.001).

Table 3 presents a comparison of the number and types of physical co-morbid physical conditions among patients in the study (BMP) and control groups. It points to statistically significant differences in the number of conditions, where 14.2% of the study group patients had more than one condition, compared to only 4.6% of those in the control group (P<0.001). Also, as regards the types of co-morbid physical conditions, BMP patients had statistically significantly higher rates of tuberculosis (p=0.004), and anti-HCV (p<0.001).

Table 4 illustrates the comparison of psychiatric co-morbid conditions among patients in the study (BMP) and control groups. It points to no statistically significant difference as regards the presence or absence of such conditions. However, the types of diagnoses showed a significant difference, where more patients in the control group had drug induced psychoses (20.2%), compared to BMP patients (13.2%), p=0.009. Meanwhile, the history of suicidal attempts was higher among

	Group				X <sup>2</sup>	p-value
	BMP (n=401)		Control (n=366)			
	No.	%	No.	%		
Age (years):						
<21	29	7.2	28	7.7		
21-	139	34.7	192	52.5		
30-	152	37.9	102	27.9		
40+	81	20.2	44	12.0		
Range	18-63		18-64			
Mean $\pm$ SD	31.9 $\pm$ 8.4		29.1 $\pm$ 8.0		t=4.61	<0.001*
Total educational years:						
<6	13	3.2	27	7.4		
6-9	261	65.1	244	66.7	9.57	0.02*
10-15	94	23.4	76	20.8		
16+						
Range	0-16		0-16			
Mean $\pm$ SD	9.3 $\pm$ 3.1		8.5 $\pm$ 3.2		t=3.48	0.001*
Marital status:						
Single	252	62.8	246	67.2		
Married	101	25.2	105	28.7	15.87	<0.001*
Divorced/separated/widow	48	12.0	15	4.1		
Current job:						
Professional	16	4.0	10	2.7		
Clerical	28	7.0	39	10.7		
Skilled	48	12.0	90	24.6		
Trade (self business)	18	4.5	24	6.6	33.59	<0.001*
Never attended a job	27	6.8	23	6.3		
Jobless	257	64.3	171	46.7		
Retired	6	1.5	9	2.5		
Job status:						
Unemployed	290	72.3	203	55.5		
Working	111	27.7	163	44.5	23.67	<0.001*

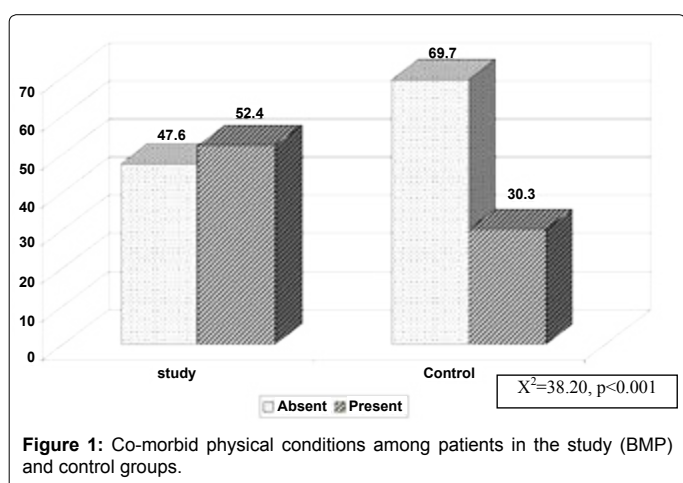
(\*) Statistically significant at p<0.05

**Table 1:** Comparison of the socio-demographic characteristics of patients in the study group (BMP) and control group.

	Group				X <sup>2</sup>	p-value
	BMP (n=401)		Control (n=366)			
	No.	%	No.	%		
Smoking status:						
Non-smoker	5	1.2	7	1.9		
Current smoker	396	98.8	359	98.1	0.55	0.46
Smoking years:						
<5	15	3.8	27	7.5		
5-	77	19.4	125	34.8		
10+	304	76.8	207	57.7		
Range	2-45		1-41			
Mean±SD	15.1 ± 7.7		12.4 ± 7.5		t=4.82	<0.001*

(\*) Statistically significant at p<0.05

**Table 2:** Comparison of smoking among patients in the study group (BMP) and control group.



**Figure 1:** Co-morbid physical conditions among patients in the study (BMP) and control groups.

	Group				X <sup>2</sup>	p-value
	BMP (n=401)		Control (n=366)			
	No.	%	No.	%		
Total co-morbid physical conditions:						
0	191	47.6	255	69.7		
1	153	38.2	94	25.7	43.39	<0.001*
2-3	57	14.2	17	4.6		
Co-morbid physical conditions:@						
Hypertension	5	1.2	3	0.8	Fisher	0.73
Diabetes mellitus	17	4.2	12	3.3	0.49	0.49
Tuberculosis	12	3.0	1	0.3	8.49	0.004*
Anti-HCV	165	41.1	35	9.6	99.03	<0.001*
HBV	13	3.2	18	4.9	1.39	0.24
HIV	0	0.0	1	0.3	Fisher	0.48
Others	61	15.2	60	16.4	0.20	0.65

(\*) Statistically significant at p<0.05

(@) Not mutually exclusive

**Table 3:** Comparison of co-morbid physical conditions among patients in the study group (BMP) and control group.

study group patients (2.5%), compared to the control group (0.5%), and the difference was statistically significant, p=0.03.

## Discussion

This study was carried out as a contribution to decrease the prevalence of relapse rate by making recommendations regarding BMP

protocol. This was achieved through assessing the prognosis of drug abusers admitted in the Behavioral Modification Program (BMP) unit at Al-Amal hospital in Jeddah governorate for one year (2006). The socio-demographic characteristics of patients in the present study (Table 1) are similar to those reported in previous studies in the Kingdom. Thus, the mean age of both groups was around 30 years, which is close to the age reported in a study on addicts of heroin and alcohol in Jeddah [17]. The mean age of their study was 32.2 years, compared to 29.1 and 31.9 years in the control and study groups in our series. This is in fact the age where the addict would seek help to solve his problem after the age of adolescence and early adulthood, when the sequels of addiction are not still realized by him. In this regard, it has been claimed that increasing age is associated with more maturation and more seeking for solution of the addiction problem [18].

The levels of education of patients in our groups were also close to those previously reported. Thus, the mean years of education was around nine years, which corresponds to just a basic level of education (elementary and preparatory). Also, about two thirds of the present study patients completed 6 to 9 grades of education. A closely similar percentage was reported in KSA where 64% of their patients had completed 6–9 grades of education. On the same line, a study on addicts in Jeddah has mentioned that over 50% of drug users were without high school education [19]. These findings point to the untoward effects of drug addiction on education of the affected person, with subsequent negative effects on his future life, job opportunities, and career.

As regards marital status, about two thirds of the patients in the study and control groups of the current research were single. In congruence with this finding [17], have found that 66.7% of the addict patients in their study sample were single and divorced. Moreover, it has been reported that more than half of the drug users in their sample were single [19]. The finding is expected since the future of the addict person is jeopardized, and his chance of getting married is low, especially in conservative communities, where addiction is considered as a stigma. Also, in case the addict patient gets married, the physical, psychological, and financial problems associated with his problem would certainly lead to unstable marital life, which will soon end in divorce [20].

According to the present study findings, about three-fourth of the patients in study group, and more than half of those in the control

	Group				X <sup>2</sup>	p-value
	BMP (n=401)		Control (n=366)			
	No.	%	No.	%		
Co-morbid psychiatric diagnoses:						
Absent	308	76.8	262	71.6		
Present	93	23.2	104	28.4	2.74	0.10
Co-morbid psychiatric diagnoses:@						
Drug induced psychosis	53	13.2	74	20.2	6.79	0.009*
Psychosis	10	2.5	10	2.7	0.04	0.84
Drug induced mood disorder	12	3.0	11	3.0	0.00	0.99
Mood disorder	15	3.7	7	1.9	2.30	0.13
Other psychiatric disorders	5	1.2	2	0.5	1.04	0.31
Positive history of suicidal attempt	10	2.5	2	0.5	4.71	0.03*

(\*) Statistically significant at p<0.05

(@) Not mutually exclusive

**Table 4:** Comparison of co-morbid psychiatric conditions among patients in the study group (BMP) and control group.

group were either jobless or had never attended a job. The finding related to the study group is in agreement with a study that reported that the majority (75.2%) of their addict patients were jobless [17]. Meanwhile, the rate of unemployment in our control group is similar to that reported in a study in KSA, where more than half of the drug users were found to be unemployed [19]. Also, a rate of 26.4% of addicts who never attended a job has been reported in KSA [21]. This high rate of unemployment among addicts is quite plausible. It is attributed to their inability to commit themselves to any regular activity, along with their irresponsible behavior that makes them unable to sustain a job for a long time. Added to this is the high probability that they have not attained a level of education compatible with competitive jobs [22].

Concerning smoking, the present study has shown that the great majority of patients in both study and control groups were current smokers. Moreover, the number of smoking years was 12 to 15 years in the two groups, which mean that smoking started at early adolescence, given the mean age of these patients. These findings are in agreement with a Saudi study, which similarly demonstrated that ninety seven percent of his addict patients were smokers, and more than half of them had started smoking before the age of 15 years [23]. The association between smoking and addiction is well documented, and even some researchers have considered smoking as an addictive habit [24].

The present study has revealed that more than half of our study group, and about one third of our control group patients had at least one co-morbid physical condition, and the difference was statistically significant ( $P < 0.001$ ). These findings are incongruent with the figures reported in a hospital-based survey of substance dependence in the Kingdom of Saudi Arabia. In his study, it was found that 87% of the addict patients had some kind of physical disorder. This might be related to differences in drugs used [23].

The association between HCV and addiction is well documented. The prevalence of hepatitis C virus antibodies was shown to be 60.5% among intravenous drug abusers, with a high risk of acquiring HCV infection. Intravenous drug use (IVDU) was found to be responsible for approximately 60% of the new cases of HCV infection [25,26]. Moreover, the prevalence of antibodies to hepatitis C virus (anti-HCV) in a population of IVDU in Jeddah, Kingdom of Saudi Arabia (KSA) was reported to be even higher (74.6%), whereas the prevalence of anti-HCV in drug dependent patients who did not use the intravenous route was 10.5% [27].

As regards the types of co-morbid conditions, the most commonly encountered disorder in the present study was the presence of anti-HCV, which was found in more than two-fifth of BMP patients, and about one-tenth of the control ones, and the difference was statistically significant ( $P < 0.001$ ). These figures are lower than those reported in a KSA study where Hepatitis C Virus was detected in 69% of the patients [23]. This difference might be explained by the high percentage of intravenous injectors in that other study. Our figures are also lower than the figures mentioned in Jeddah, where the prevalence of hepatitis C virus infection amounted to 63.9% in drug addicts [21]. Conversely, a much lower prevalence of HCV antibodies was found among drug users in the Eastern Province of KSA, which was only 6.5% [28]. The discrepancies among the various studies in the Kingdom might be explained by the different nationalities included in the various study samples, since many of the non-Saudi workers come from countries where the rate of HCV is high. They are also related to the types and modes of use of drugs [29]. On the other hand, the prevalence of hepatitis B virus, as a co-morbid physical condition among patients in the present study sample was relatively low, 3.2% and 4.9% in the study

and control groups, respectively. The figures are quite close to those reported by in a study on the prevalence of Hepatitis C virus antibodies among intravenous drug abusers and prostitutes in Damascus, Syria. The rate of Hepatitis B virus was 5.3% among the intravenous drug abusers. The low rates of hepatitis B, compared to Hepatitis C might be related to the decline of the rates of this disease following the institution of its vaccine in the early nineties [30].

According to the present study findings, about one-fourth of the patients in both study and control groups had some type of psychiatric co-morbid condition. The most commonly encountered disorder was drug induced psychoses (20.2%), compared to BMP patients (13.2%), ( $P = 0.009$ ). Meanwhile, the history of suicidal attempts was higher among study group patients (2.5%), compared to the control group (0.5%), and the difference was statistically significant,  $p = 0.03$ . These findings are in agreement with a national household survey of nicotine, alcohol, and drug dependence and psychiatric co-morbidity in the United Kingdom [31]. They have reported a lower rate of psychiatric co-morbidities (12%) in the non-dependent population, compared with 22% of the nicotine-dependent, 30% of the alcohol-dependent, and 45% of the drug-dependent population. On the same line, it has been clarified that epidemiologic studies have shown that between 30-60% of drug abusers have concurrent mental health diagnosis [32]. Meanwhile, in contradiction with the present study findings, it has been reported that only 4.5% of addict patients had mental disorders [23]. The differences might be related to the drugs used for addiction. In fact, some substances like cannabis, amphetamines, and alcohol are more likely to be associated with greater risks of co-morbid psychosis.

## Conclusion

In the light of the study findings, it is concluded that addiction is associated with high levels of low education, unemployment, and smoking. The drugs mostly used were amphetamine, cannabis, and alcohol, and the age of start was around 20 years. Further prospective research is suggested, including OPD patients in addition to those hospitalized, with longer duration of follow-up to assess the return of the patient to the society and normal life years after remission, with focusing on various program components to assess their relative effectiveness. The current study faced some limitations which include (1) incomplete or unclear documentation in the medical files about some of the patients' data, (2) dropout of some patients from follow-up after discharge, with no data about their abstinence or relapse. The study represents only those admitted to the hospital and did not involve those attending OPD programs only.

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