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Original Article

Drug use patterns and demographic correlations of residents of Saudi therapeutic communities for addiction

Abdulaziz T. Alshomrani, MD [a,*], Abdullah T. Khoja, MD [b], Saeeed F. Alseraihah, Phd [c] and Mahmoud A. Mahmoud, MD [b]

[a] *Department of Clinical Neuroscience, College of Medicine, Al Imam Mohammad Ibn Saud Islamic University, Riyadh, KSA*
[b] *Department of Public Health, College of Medicine, Al Imam Mohammad Ibn Saud Islamic University, KSA*
[c] *National Committee for Narcotic Control, KSA*

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الملخص

أهداف البحث: تصف هذه الدراسة سمات نزلاء المجمعات العلاجية السعودية، وأنماط تعاطيهم للمخدرات، والعلاقة بين هذه المتغيرات.

طرق البحث: تفحص هذه الدراسة الاستعادية بيانات جميع نزلاء مجمعات الإدمان العلاجية السعوديين الذين التحقوا بها منذ تأسيس أول مجمع علاجي عام ٢٠٠٠ حتى منتصف ٢٠١٤. وتشمل هذه المجمعات ثلاثة مجمعات حكومية ومؤسستين غير حكومية، ويقع اثنان من هذه المجمعات في الدمام وواحد في كلا من الرياض، وجدة، والطائف وقد بلغ مجموع النزلاء ٢٠٢٣ نزيلا.

النتائج: جميع نزلاء المجمعات العلاجية هم من الذكور البالغين؛ ٨٥.٦٪ منهم سعوديون، أما البقية فجميعهم تقريبا من مواطني دول مجلس التعاون الخليجي. وكان متوسط أعمارهم ٩,٣٣ عاما (±٨.٨ عاما)، ومستويات تعليم معظمهم من الدراسة الثانوية أو أقل، والمتزوجون منهم ٢٥٪، و٧٠.٨٪ منهم بلا وظيفة. وتشير أنماط تعاطيهم للمخدرات إلى أن ٣٥.٨٪ منهم يستخدمون الأفيون، و١٥٪ الحشيش، و١١.٩٪ يستخدمون الحشيش والأمفيتامين معا، و١١.١٪ الأمفيتامين، و٧.٩٪ الخمور، ويستخدم ١٠.٩٪ منهم ٣ أو أكثر من أنواع المخدرات في الوقت نفسه. وقد وُجد أن تعاطي الأمفيتامين والحشيش أكثر انتشارا بين النزلاء الأصغر سنا مقارنة بالأفيون والخمور، التي كانت أكثر استخداما بين النزلاء الأكبر سنا. وكان الأفيون أكثر استخداما بين سكان المنطقة الغربية بينما سكان المناطق الشمالية والجنوبية يفضلون الأمفيتامين.

الاستنتاجات: أظهرت هذه الدراسة أن أنماط استخدام المخدرات للنزلاء مشابهة للنزلاء المنومين في منشآت علاجية أخرى. ولكن، إدمان الأفيون كان أكثر انتشارا. بالإضافة إلى ذلك، كان نوع المخدر المستخدم يختلف حسب منطقة السكن، مما يستدعي الانتباه عند التخطيط لتوفير الخدمات في هذه المناطق.

الكلمات المفتاحية: المجتمع العلاجي السعودي؛ تعاطي المخدرات؛ الأفيون؛ الحشيش؛ الخمور

Abstract

Objectives: This study describes the characteristics of residents in Saudi therapeutic communities (TCs), their patterns of drug use, and the correlations between these variables.

Methods: This retrospective study examined all Saudi TC residents admitted since the establishment of the first TC in 2000 until mid-2014. The TCs include three governmental and two non-governmental enterprises: two TCs in Dammam and one each in Riyadh, Jeddah, and Taif, with a total population of 2023 residents.

Results: All TC residents were adult males; 85.6% were Saudis, and almost all remaining residents were from the Gulf Cooperation Council countries. The mean age of residents was 33.9 years (±8.8 years), and their educational levels were mostly high school or lower; 25% were married, and 70.8% were jobless. The pattern of drug use indicated that 35.8% used opioids, 15% used hash, 11.9% used both hash and amphetamine, 11.1% used amphetamine, 7.9% used alcohol, and 10.9% used 3 or more drugs simultaneously. Amphetamine and hash dependencies were more prevalent among younger residents in comparison to opioids and alcohol, which were more common among older residents. Opioids were more used

* Corresponding address: Department of Clinical Neuroscience, College of Medicine, Al Imam Mohammad Ibn Saud Islamic University, Riyadh, KSA.
E-mail: azsham@hotmail.com (A.T. Alshomrani)
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by the western region residents, while northern and southern regions residents preferred amphetamine.

Conclusion: This study showed that the residents' drug use patterns are similar to those in other inpatient treatment services. However, opioid dependency is overrepresented. Furthermore, the type of drug used differs according to the residence region, which may warrant consideration when planning services for these regions.

Keywords: Alcohol; Drug use; Hash; Opioid; Saudi therapeutic community

Introduction

A therapeutic community (TC) is an effective long-term treatment modality for addiction that takes into account the complexity of addiction management.[1–5] A TC is a drug-free residential setting that focuses on patient rehabilitation through social learning and a family model, with main goals of sustaining abstinence and improving physical, psychological, social, and spiritual health.[6] The essential components of TCs include social responsibility enhancement, peer feedback about each resident's behaviour, rule model practice, effective interactive relationships between the residents, a systematic structure of daily living with a desire to improve, and recognition of gains in an open, shared community with positive communication and reciprocal relationships.[3]

Various factors can affect the outcomes of TCs, such as the patients' social and medical characteristics and the program's content and duration.[1,2,7–9] Examples of social determinants of TCs outcomes include age, gender, employment history, preferred type of drug, marital status, education level, previous treatment in TCs, and family and social support.[1,2,7–9] Most TC residents are in their 30s, and the mean age is between 31 and 36 years old.[8,10–12] Residents are unmarried and unemployed. More than half of them do not surpass secondary school education, and they are mainly treated for the abuse of heroin, stimulants, alcohol, and cannabis. However, using more than one drug is usually the norm.[8,10–13]

Most of the populations in TC studies are male. Over 85% of the population with as much as 100% can be male in developing countries.[8,10–12] However, the introduction of modified TCs in Western countries for women and adolescents may change these percentages.[14] In KSA, only five TCs were in operation as of 2014. The first TC started operating in early 2000 in Dammam in the eastern region. Four TCs were later established between 2009 and 2013.[15] Three of these five TCs are government facilities, which are operated and supervised by the Ministry of Health through the Alamal Mental Health Complexes in Dammam, Riyadh, and Jeddah.[15] The other two TCs are operated by non-governmental non-profit organizations. One of them is licenced by the Ministry of Social Affairs, while the other one is licenced by the National Committee for Narcotics Control.[15]

The literature is lacking in studies that describe drug addiction in the Saudi population. Similarly, there is limited knowledge about the TCs in KSA, including the characteristics of residents, their drug use patterns, and their addiction patterns. In this paper, we describe the characteristics of Saudi TC residents and their patterns of drug use, and we explore the correlations between these variables.

Materials and Methods

Population and source of data

This study was conducted as a part of a national project to assess the status of addiction management and evaluate addiction TCs in KSA. The study included all TC residents in KSA who were discharged prior to September 9, 2014. At the time of the study, there were only five addiction TCs in the KSA, and all of them were included. Data were primarily collected from the patients' charts and records using comprehensive forms that include demographic information, the number of admissions, diagnoses, dates of each admission, lengths of stay, reasons for discharge, and drugs used.

The data were collected during visits by the principle investigator between September and December 2014. Visits to each TC occurred over 10 days to collect data and evaluate the infrastructure, policies, procedures, treatment and rehabilitation programs, and competencies of the treatment teams. During each visit, the author assigned and supervised two health professionals from each TC to collect data from resident files and to record them on the form. All files were included in the study, and missing data were addressed. Ethical approval of the project was issued by the Internal Review Board of the College of Medicine at Al Imam Muhammad Ibn Saud Islamic University.

Data analysis

STATA® 14 MP was used for data management and analysis. Descriptive statistics were used to summarize the data. The characteristics of TC residents are described by frequencies and percentages. The means and standard deviation (SD) are presented for continuous variables, while frequencies and percentages are used to present the distribution of cases based on the type of drugs used. Pearson's chi-squared (χ^2) test was used to assess the differences between groups, depending on whether there was a normal distribution and depending on the types of variables.

Simple and multivariable logistic regression model analyses were performed to assess the association between the type of drug and social factors. The odds ratio (OR) is reported with the significance level (P-value) and confidence interval. All relevant and collected factors were used in the simple logistic regression. For multivariable logistic regression, the initial model was built by introducing all the factors with the specific type of drug used as the outcome (alcohol, heroin, amphetamine, hash, hash and amphetamine together, and three or more drugs). Next, a stepwise approach for variable selection and goodness of fit was used to develop the best-fitted model. A chain multiple imputation method was used to fill in the missing values. All analytical models used the multiple imputation features in estimate calculations. Sensitivity analysis was conducted to compare our models with those using the original data with missing values.

Results

The survey included 2023 residents who represented all admissions to the five Saudi addiction TCs since the establishment of the first TC in 2000 until mid-2014. The overall missing data were minimal (<1.8%). A multiple imputation process successfully filled in the missing data.

Subjects' socio-demographics and centre characteristics

The age of the patients ranged between 20 and 77 years. The mean age was 33.9 years, with a standard deviation (SD) of 8.8 years. There was a significant difference between the centres in relation to mean ages (P-value = 0.02), which were 36.4 (SD 9.1), 33.7 (SD 8.9), 34.5 (SD 8.5), 33.2 (SD 8.6), and 33.2 (SD 7.7) years for individuals who were admitted to

Table 1: Socio-demographic characteristics of TC residents who utilized services in KSA until 1/6/2014.

	Dammam	Riyadh	Bedayah	Jeddah	Taif	Total	P-value
	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	
	859 (42.5)	528 (26.1)	463 (22.9)	147 (7.3)	26 (1.3)	2023 (100)	X^2
Age							
20–25	178 (20.7)	86 (16.3)	104 (22.5)	20 (13.6)	4 (15.4)	392 (19.4)	<0.001
26–30	213 (24.8)	107 (20.3)	101 (21.8)	25 (17)	6 (23.1)	452 (22.3)	
31–35	138 (16.1)	122 (23.1)	95 (20.5)	27 (18.4)	8 (30.8)	390 (19.3)	
36–40	123 (14.3)	81 (15.3)	73 (15.8)	20 (13.6)	4 (15.4)	301 (14.9)	
41–45	97 (11.3)	59 (11.2)	46 (9.9)	32 (21.8)	2 (7.7)	236 (11.7)	
46–50	88 (10.2)	50 (9.5)	25 (5.4)	14 (9.5)	1 (3.8)	178 (8.8)	
>50	22 (2.6)	23 (4.4)	19 (4.1)	9 (6.1)	1 (3.8)	74 (3.7)	
Nationality							
Other	136 (15.8)	45 (8.5)	89 (19.2)	18 (12.2)	3 (11.5)	291 (14.4)	<0.001
Saudi	723 (84.2)	483 (91.5)	374 (80.8)	129 (87.8)	23 (88.5)	1732 (85.6)	
Employment							
Unemployed	651 (75.8)	346 (65.5)	295 (63.7)	127 (86.4)	13 (50)	1432 (70.8)	<0.001
Employed	196 (22.8)	140 (26.5)	160 (34.6)	17 (11.6)	9 (34.6)	522 (25.8)	
Student	12 (1.4)	25 (4.7)	8 (1.7)	3 (2)	2 (7.7)	50 (2.5)	
Retired	0 (0)	17 (3.2)	0 (0)	0 (0)	2 (7.7)	19 (0.9)	
Area							
Riyadh	156 (18.2)	349 (68.6)	64 (14)	2 (1.4)	4 (15.4)	575 (28.8)	<0.001
Western	90 (10.5)	34 (6.7)	63 (13.8)	105 (71.9)	19 (73.1)	311 (15.6)	
Eastern	366 (42.7)	15 (2.9)	184 (40.2)	4 (2.7)	1 (3.8)	570 (28.5)	
Southern	70 (8.2)	41 (8.1)	46 (10)	11 (7.5)	0 (0)	168 (8.4)	
Northern	44 (5.1)	26 (5.1)	19 (4.1)	8 (5.5)	0 (0)	97 (4.9)	
Bahrain	15 (1.7)	0 (0)	17 (3.7)	0 (0)	0 (0)	32 (1.6)	
Oman	82 (9.6)	44 (8.6)	48 (10.5)	16 (11)	2 (7.7)	192 (9.6)	
Kuwait	31 (3.6)	0 (0)	14 (3.1)	0 (0)	0 (0)	45 (2.3)	
UAE	0 (0)	0 (0)	2 (0.4)	0 (0)	0 (0)	2 (0.1)	
Qatar	4 (0.5)	0 (0)	1 (0.2)	0 (0)	0 (0)	5 (0.3)	
Marital status							
Single	645 (75.1)	319 (60.4)	213 (46)	117 (79.6)	26 (100)	1320 (65.2)	<0.001
Married	151 (17.6)	132 (25)	186 (40.2)	20 (13.6)	0 (0)	489 (24.2)	
Divorced	63 (7.3)	77 (14.6)	64 (13.8)	10 (6.8)	0 (0)	214 (10.6)	
Education							
University	7 (0.8)	0 (0)	8 (1.7)	0 (0)	0 (0)	15 (0.7)	
Secondary	330 (38.4)	237 (44.9)	167 (36.1)	32 (21.8)	13 (50)	779 (38.5)	<0.001
Intermediate	304 (35.4)	169 (32)	162 (35)	74 (50.3)	9 (34.6)	718 (35.5)	
Primary	182 (21.2)	101 (19.1)	105 (22.7)	35 (23.8)	2 (7.7)	425 (21)	
Illiterate	36 (4.2)	21 (4)	21 (4.5)	6 (4.1)	2 (7.7)	86 (4.3)	

Table 2: Type of drugs used and characteristics of the TC residents.

	Type of Drugs*										Total	P-value
	AMPH	OP	ALC	HASH	MULT	AMPH-ALC	AMPH-HASH	HASH-ALC	HASH_OP	Others		
	225 (11.1)	724 (35.8)	160 (7.9)	303 (15)	214 (10.6)	55 (2.7)	240 (11.9)	73 (3.6)	19 (0.9)	9 (0.4)	2022 (100)	
Age												
20–25	60 (15.3)	94 (24)	18 (4.6)	80 (20.4)	51 (13)	10 (2.6)	55 (14)	16 (4.1)	7 (1.8)	1 (0.3)	392 (19.4)	<0.001
26–30	62 (13.7)	82 (18.1)	22 (4.9)	104 (23)	61 (13.5)	13 (2.9)	81 (17.9)	21 (4.6)	2 (0.4)	4 (0.9)	452 (22.4)	
31–35	52 (13.3)	106 (27.2)	25 (6.4)	56 (14.4)	58 (14.9)	10 (2.6)	60 (15.4)	18 (4.6)	4 (1)	1 (0.3)	390 (19.3)	
36–40	22 (7.3)	133 (44.3)	38 (12.7)	39 (13)	16 (5.3)	13 (4.3)	26 (8.7)	9 (3)	2 (0.7)	2 (0.7)	300 (14.8)	
41–45	20 (8.5)	141 (59.7)	19 (8.1)	13 (5.5)	18 (7.6)	7 (3)	10 (4.2)	5 (2.1)	3 (1.3)	0 (0)	236 (11.7)	
46–50	6 (3.4)	124 (69.7)	25 (14)	9 (5.1)	5 (2.8)	1 (0.6)	4 (2.2)	4 (2.2)	0 (0)	0 (0)	178 (8.8)	
>50	3 (4.1)	44 (59.5)	13 (17.6)	2 (2.7)	5 (6.8)	1 (1.4)	4 (5.4)	0 (0)	1 (1.4)	1 (1.4)	74 (3.7)	
Nationality												
Others	3 (1)	230 (79)	17 (5.8)	12 (4.1)	11 (3.8)	1 (0.3)	7 (2.4)	2 (0.7)	8 (2.7)	0 (0)	291 (14.4)	<0.001
Saudi	222 (12.8)	494 (28.5)	143 (8.3)	291 (16.8)	203 (11.7)	54 (3.1)	233 (13.5)	71 (4.1)	11 (0.6)	9 (0.5)	1731 (85.6)	
Employment												
Unemployed	138 (9.6)	583 (40.7)	97 (6.8)	211 (14.7)	137 (9.6)	33 (2.3)	155 (10.8)	59 (4.1)	15 (1)	4 (0.3)	1432 (70.8)	<0.001
Employed	81 (15.5)	128 (24.6)	55 (10.6)	76 (14.6)	61 (11.7)	22 (4.2)	79 (15.2)	13 (2.5)	4 (0.8)	2 (0.4)	521 (25.8)	
Student	5 (10)	8 (16)	3 (6)	12 (24)	12 (24)	0 (0)	6 (12)	1 (2)	0 (0)	3 (6)	50 (2.5)	
Retired	1 (5.3)	5 (26.3)	5 (26.3)	4 (21.1)	4 (21.1)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	19 (0.9)	
Area												
Riyadh	61 (10.6)	146 (25.4)	63 (11)	91 (15.8)	114 (19.8)	9 (1.6)	56 (9.7)	26 (4.5)	3 (0.5)	6 (1)	575 (28.8)	<0.001
Western	27 (8.7)	168 (54)	17 (5.5)	42 (13.5)	13 (4.2)	5 (1.6)	28 (9)	7 (2.3)	3 (1)	1 (0.3)	311 (15.6)	
Eastern	75 (13.2)	166 (29.1)	42 (7.4)	96 (16.8)	37 (6.5)	22 (3.9)	99 (17.4)	27 (4.7)	5 (0.9)	1 (0.2)	570 (28.5)	
Southern	35 (20.8)	6 (3.6)	10 (6)	39 (23.2)	22 (13.1)	14 (8.3)	33 (19.6)	9 (5.4)	0 (0)	0 (0)	168 (8.4)	
Northern	23 (23.7)	10 (10.3)	11 (11.3)	20 (20.6)	13 (13.4)	4 (4.1)	15 (15.5)	0 (0)	0 (0)	1 (1)	97 (4.9)	
Bahrain	1 (3.1)	26 (81.2)	1 (3.1)	1 (3.1)	0 (0)	0 (0)	2 (6.2)	0 (0)	1 (3.1)	0 (0)	32 (1.6)	
Oman	0 (0)	161 (83.9)	14 (7.3)	1 (0.5)	10 (5.2)	0 (0)	0 (0)	1 (0.5)	5 (2.6)	0 (0)	192 (9.6)	
Kuwait	0 (0)	34 (75.6)	2 (4.4)	7 (15.6)	0 (0)	1 (2.2)	0 (0)	0 (0)	1 (2.2)	0 (0)	45 (2.3)	
UAE	0 (0)	2 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (0.1)	
Qatar	0 (0)	1 (20)	0 (0)	0 (0)	0 (0)	0 (0)	3 (60)	0 (0)	1 (20)	0 (0)	5 (0.3)	
Marital status												
Single	150 (11.4)	448 (33.9)	75 (5.7)	219 (16.6)	150 (11.4)	34 (2.6)	170 (12.9)	56 (4.2)	13 (1)	5 (0.4)	1320 (65.3)	<0.001
Married	64 (13.1)	184 (37.6)	60 (12.3)	64 (13.1)	38 (7.8)	16 (3.3)	50 (10.2)	8 (1.6)	2 (0.4)	3 (0.6)	489 (24.2)	
Divorced	11 (5.2)	92 (43.2)	25 (11.7)	20 (9.4)	26 (12.2)	5 (2.3)	20 (9.4)	9 (4.2)	4 (1.9)	1 (0.5)	213 (10.5)	
Education												
University	4 (26.7)	5 (33.3)	1 (6.7)	2 (13.3)	1 (6.7)	1 (6.7)	1 (6.7)	0 (0)	0 (0)	0 (0)	15 (0.7)	0.021
Secondary	85 (10.9)	264 (33.9)	56 (7.2)	133 (17.1)	89 (11.4)	14 (1.8)	91 (11.7)	36 (4.6)	6 (0.8)	5 (0.6)	779 (38.5)	
Intermediate	83 (11.6)	273 (38.1)	51 (7.1)	100 (13.9)	71 (9.9)	24 (3.3)	86 (12)	23 (3.2)	6 (0.8)	0 (0)	717 (35.5)	
Primary	37 (8.7)	162 (38.1)	46 (10.8)	54 (12.7)	39 (9.2)	14 (3.3)	53 (12.5)	12 (2.8)	6 (1.4)	2 (0.5)	425 (21)	
Illiterate	16 (18.6)	20 (23.3)	6 (7)	14 (16.3)	14 (16.3)	2 (2.3)	9 (10.5)	2 (2.3)	1 (1.2)	2 (2.3)	86 (4.3)	
Home centre												
Dammam	111 (12.9)	351 (40.9)	49 (5.7)	99 (11.5)	48 (5.6)	31 (3.6)	123 (14.3)	34 (4)	11 (1.3)	2 (0.2)	859 (42.5)	<0.001
Riyadh	20 (3.8)	127 (24.1)	64 (12.1)	94 (17.8)	156 (29.6)	5 (0.9)	31 (5.9)	24 (4.6)	2 (0.4)	4 (0.8)	527 (26.1)	
Bedayah	69 (14.9)	156 (33.7)	34 (7.3)	80 (17.3)	10 (2.2)	18 (3.9)	77 (16.6)	11 (2.4)	6 (1.3)	2 (0.4)	463 (22.9)	
Jeddah	19 (12.9)	85 (57.8)	12 (8.2)	22 (15)	0 (0)	1 (0.7)	6 (4.1)	2 (1.4)	0 (0)	0 (0)	147 (7.3)	
Taif	6 (23.1)	5 (19.2)	1 (3.8)	8 (30.8)	0 (0)	0 (0)	3 (11.5)	2 (7.7)	0 (0)	1 (3.8)	26 (1.3)	

(*continued on next page*)

Table 2 (*continued*)

	Type of Drugs*									Total	P-value
	AMPH	OP	ALC	HASH	MULT	AMPH-ALC	AMPH-HASH	HASH-ALC	HASH_OP	Others		
Reason for discharge												
Complete program	54 (15.5)	117 (33.5)	22 (6.3)	36 (10.3)	49 (14)	12 (3.4)	45 (12.9)	7 (2)	4 (1.1)	3 (0.9)	349 (17.3)	<0.001
Patient request	142 (11.2)	428 (33.6)	97 (7.6)	218 (17.1)	130 (10.2)	35 (2.8)	159 (12.5)	49 (3.9)	10 (0.8)	4 (0.3)	1272 (62.9)	
Violate regulations	10 (9.9)	30 (29.7)	12 (11.9)	19 (18.8)	12 (11.9)	2 (2)	13 (12.9)	2 (2)	0 (0)	1 (1)	101 (5)	
Relapse	19 (6.3)	149 (49.7)	29 (9.7)	30 (10)	23 (7.7)	6 (2)	23 (7.7)	15 (5)	5 (1.7)	1 (0.3)	300 (14.8)	
Number of admissions												<0.001
1	213 (11.5)	638 (34.3)	147 (7.9)	284 (15.3)	206 (11.1)	53 (2.9)	220 (11.8)	72 (3.9)	17 (0.9)	9 (0.5)	1859 (91.9)	
2	12 (8.9)	70 (51.9)	11 (8.1)	17 (12.6)	6 (4.4)	2 (1.5)	17 (12.6)	0 (0)	0 (0)	0 (0)	135 (6.7)	
3	0 (0)	16 (57.1)	2 (7.1)	2 (7.1)	2 (7.1)	0 (0)	3 (10.7)	1 (3.6)	2 (7.1)	0 (0)	28 (1.4)	

*AMPH: Amphetamine, OP: Opioids, ALC: Alcohol, HASH: Hash, MULT: Multiple.

the Jeddah, Dammam, Riyadh, Bedayah, and Taif TCs, respectively. Table 1 presents the demographic and social characteristics of the patients. The patients were distributed among the five TCs as follows: 42% in Dammam, 26.1% in Riyadh, 22.9% in Bedayah, 7.3% in Jeddah, and 1.3% in Taif. While 85.6% were Saudi nationals, 14.4% were from other countries of the Gulf Cooperation Council (GCC), with approximately 66% from Oman. Table 1 shows the distribution of patients in relation to their areas of origin.

In regard to education level, 99.3% of the subjects had secondary school education or lower. Approximately 24% of the admitted patients were married, 65% were single, and 10.6% were divorced. The unemployment rate was 70.8%, which did not include students (2.5%) or those who had retired (0.9%). Approximately 35.8% of admitted patients were dependent on opioids. Hash was the second most frequent reason for admission (15%), followed by hash and amphetamine together (11.9%), amphetamine alone (11.1%), three drugs or more (10.6%), and alcohol (7.9%). Table 2 shows the distribution of patients in relation to the different types or groups of drugs, social and demographic characteristics, centres, number of admissions, and reasons for discharge.

Simple and multivariable logistic regression analyses

The simple logistic regression showed that the mean age of individuals at the Jeddah TC was significantly higher than in other centres (Table 3). The results also show that the risk of being treated for any category of the drugs mentioned is influenced by age, employment, marital status, area of origin, and education level. All social variables were entered into multivariable logistic regression models after controlling for these influential factors (Table 4). The results revealed significantly lower odds of being treated for amphetamine and hash addiction among older subjects than the age group of 20–25 years (Table 4). On the other hand, opioid and alcohol showed a reversed association with age.

Discussion

This is the first study to describe the characteristics of residents in Saudi TCs for addiction. All residents were adult men since there are no TCs for adolescents or women in KSA. The majority of the study population was treated in TCs in the eastern region (64.9%), which consists of the Dammam TC (42%) and the Bedayah TC (22.9%). However, only 28.5% of TC residents were living in the eastern region. This can mainly be explained by two factors: the Dammam TC was established nine years before the other TCs,[12] and TC services are lacking in other regions.

Although 28.8% of the residents were living in Riyadh, the Riyadh TC was not established until 2009, which is also applicable to the western region. Although 13.3% of the Saudi TC population were from the southern and northern regions, no addiction TC services are provided in these areas. The lack or inaccessibility of such services in these areas can

Table 3: Simple logistic regression for drug used and demographic factors.

	AMPH			OP			ALC			HASH			Two and more		
	OR	P-value	CI	OR	P-value	CI	OR	P-value	CI	OR	P-value	CI	OR	P-value	CI
Age															
20−25(R)*	1			1			1			1			1		
26−30	0.89	0.54	(0.6−1.3)	0.74	0.08	(0.53−1.03)	0.99	0.98	(0.51−1.94)	0.89	0.53	(0.63−1.27)	1.22	0.17	(0.92−1.61)
31−35	0.86	0.46	(0.58−1.28)	1.21	0.25	(0.88−1.67)	1.21	0.57	(0.63−2.35)	0.57	0.01	(0.39−0.85)	1.16	0.32	(0.87−1.55)
36−40	0.44	0	(0.26−0.74)	2.5	0	(1.81−3.47)	2.45	0	(1.33−4.54)	0.56	0.01	(0.36−0.86)	0.54	0	(0.38−0.76)
41−45	0.52	0.02	(0.3−0.88)	4.7	0	(3.32−6.67)	1.72	0.13	(0.86−3.44)	0.2	0	(0.11−0.39)	0.41	0	(0.28−0.61)
46−50	0.19	0	(0.08−0.45)	7.34	0	(4.95−10.89)	2.77	0	(1.41−5.43)	0.19	0	(0.09−0.4)	0.16	0	(0.09−0.28)
>50	0.23	0.02	(0.07−0.76)	4.67	0	(2.78−7.86)	4.65	0	(2.15−10.05)	0.11	0	(0.03−0.46)	0.35	0	(0.18−0.67)
_Cons***	0.18	0	(0.14−0.24)	0.31	0	(0.24−0.39)	0.05	0	(0.03−0.07)	0.25	0	(0.19−0.32)	0.55	0	(0.45−0.68)
Employment															
Unemployed(R)*	1			1			1			1			1		
Employed	1.84	0	(1.36−2.48)	0.49	0	(0.39−0.61)	1.4	0.09	(0.95−2.08)	0.85	0.3	(0.62−1.16)	1.28	0.03	(1.03−1.59)
Student	1.25	0.63	(0.51−3.07)	0.29	0	(0.14−0.63)	0.7	0.62	(0.17−2.92)	1.71	0.12	(0.87−3.4)	1.81	0.04	(1.03−3.19)
Retired	0.67	0.7	(0.09−5.08)	0.52	0.22	(0.19−1.47)	1.8	0.44	(0.41−7.93)	0.36	0.32	(0.05−2.67)	0.67	0.48	(0.22−2.01)
_Cons***	0.1	0	(0.08−0.12)	0.69	0	(0.62−0.77)	0.07	0	(0.05−0.08)	0.16	0	(0.13−0.18)	0.4	0	(0.35−0.45)
Area															
Riyadh(R)*	1			1			1			1			1		
Western	0.8	0.36	(0.5−1.29)	3.39	0	(2.53−4.54)	0.51	0.03	(0.28−0.93)	0.94	0.79	(0.62−1.44)	0.39	0	(0.28−0.54)
Eastern	1.28	0.18	(0.89−1.84)	1.21	0.15	(0.93−1.57)	0.83	0.4	(0.54−1.28)	1.34	0.09	(0.96−1.87)	0.86	0.22	(0.67−1.09)
Southern	2.23	0	(1.41−3.53)	0.11	0	(0.05−0.26)	0.68	0.29	(0.34−1.38)	1.63	0.04	(1.03−2.57)	1.46	0.03	(1.03−2.06)
Northern	2.63	0	(1.54−4.51)	0.34	0	(0.17−0.67)	0.83	0.67	(0.37−1.9)	1.57	0.12	(0.89−2.77)	0.88	0.58	(0.56−1.38)
Gulf	0.03	0	(0−0.23)	12.51	0	(8.79−17.82)	0.67	0.18	(0.37−1.2)	0.23	0	(0.11−0.47)	0.17	0	(0.11−0.26)
_Cons***	0.12	0	(0.09−0.15)	0.34	0	(0.28−0.4)	0.09	0	(0.07−0.12)	0.15	0	(0.11−0.19)	0.59	0	(0.5−0.7)
Marital status															
Single(R)*	1			1			1			1			1		
Married	1.17	0.33	(0.85−1.61)	1.2	0.1	(0.97−1.49)	1.92	0	(1.29−2.85)	0.63	0.01	(0.45−0.88)	0.67	0	(0.53−0.86)
Divorced	0.47	0.02	(0.25−0.88)	1.42	0.02	(1.06−1.91)	2.29	0	(1.39−3.77)	0.48	0.01	(0.28−0.8)	0.9	0.51	(0.66−1.23)
_Cons***	0.13	0	(0.11−0.15)	0.51	0	(0.45−0.57)	0.05	0	(0.04−0.07)	0.18	0	(0.15−0.21)	0.48	0	(0.42−0.54)
Education															
University(R)*	1			1			1			1			1		
Secondary	0.35	0.08	(0.11−1.11)	1.04	0.95	(0.35−3.06)	0.88	0.9	(0.11−6.84)	1.08	0.92	(0.24−4.86)	1.74	0.39	(0.49−6.22)
Intermediate	0.36	0.09	(0.11−1.15)	1.25	0.69	(0.42−3.69)	0.94	0.96	(0.12−7.35)	0.96	0.96	(0.21−4.33)	1.62	0.46	(0.45−5.78)
Primary	0.28	0.04	(0.09−0.92)	1.18	0.77	(0.4−3.52)	1.59	0.66	(0.2−12.4)	0.84	0.82	(0.18−3.81)	1.68	0.43	(0.47−6.04)
Illiterate	0.65	0.51	(0.18−2.31)	0.6	0.4	(0.18−1.96)	0.73	0.79	(0.08−7.01)	1.13	0.88	(0.23−5.61)	2.12	0.27	(0.56−8.05)
_Cons***	0.36	0.08	(0.11−1.11)	0.5	0.2	(0.17−1.45)	0.07	0.01	(0.01−0.53)	0.15	0.01	(0.03−0.68)	0.25	0.03	(0.07−0.9)
Home Centre															
Dammam(R)*	1			1			1			1			1		
Riyadh	0.27	0	(0.16−0.43)	0.45	0	(0.35−0.57)	1.39	0.13	(0.91−2.14)	0.98	0.93	(0.7−1.38)	**1.76**	0	(1.41−2.21)
Bedayah	**1.18**	0.32	(0.85−1.63)	0.74	0.01	(0.58−0.94)	1.31	0.24	(0.83−2.06)	1.53	0.01	(1.11−2.11)	0.9	0.4	(0.7−1.15)

(*continued on next page*)

Table 3 (*continued*)

	AMPH			OP			ALC			HASH			Two and more		
	OR	P-value	CI	OR	P-value	CI	OR	P-value	CI	OR	P-value	CI	OR	P-value	CI
Jeddah	1	1	(0.59–1.68)	**1.99**	0	(1.4–2.84)	**1.47**	0.25	(0.76–2.83)	1.35	0.24	(0.82–2.23)	0.16	0	(0.08–0.32)
Taif	**2.02**	0.14	(0.79–5.14)	0.35	0.04	(0.13–0.93)	0.66	0.69	(0.09–4.98)	**3.41**	0.01	(1.45–8.05)	0.73	0.51	(0.29–1.85)
_Cons***	0.15	0.00	(0.12–0.18)	0.69	0.00	(0.6–0.79)	0.06	0.00	(0.05–0.08)	0.13	0.00	(0.11–0.16)	0.41	0.00	(0.35–0.47)
Nationality															
Non-citizen(R)*	1			1			1			1			1		
Saudi	14.11	0	(4.49–44.4)	0.11	0	(0.08–0.14)	1.29	0.35	(0.75–2.21)	4	0	(2.21–7.23)	4.55	0	(3.06–6.76)
_Cons***	0.01	0	(0–0.03)	3.69	0	(2.79–4.89)	0.06	0	(0.04–0.1)	0.04	0	(0.02–0.08)	0.11	0	(0.08–0.16)

*R: Reference group.
**AMPH: Amphetamine, OP: Opioids, ALC: Alcohol, HASH: Hash.
*** _Cons: constant/intercept.

be a barrier to benefiting from TC programmes for addicts and their families.

The mean age of the residents was higher than the reported mean age for other local and international addiction treatment services.[8,10–12,16,17] Furthermore, the levels of education, employment, and marital status were lower for TC residents compared to the levels for patients in other Saudi community services for addiction treatment, such as outpatient clinics and short-term inpatient units. This reflects the disadvantaged status of these patients.[16,17] These factors may indicate that Saudi TCs attract more severe cases of addiction, which is also the case in other TCs worldwide.[1,2]

Opioid drugs were the most common category of drugs used by TC residents (35.8%), especially among GCC residents (79%). However, using more than one drug is also common among this group. Residents who live in the western region showed more use of opioids, while residents from the northern and southern regions showed more amphetamine use than other drugs. This may have occurred because these regions are border territories to amphetamine-trafficking roads. In contrast to amphetamine and hash addicts, opioid and alcohol addicts showed a positive trend of seeking treatment with advances in age. These trends parallel drug use patterns of patients in other Saudi treatment services.[16]

Alsraihah studied drug addiction in Saudi society mainly among inpatients who were being treated for addiction and found that the most common drug used was hash (56.4%), followed by amphetamine (53.1%) and alcohol (29.3%). However, opioid users represented only 19.4% of the study population.[17] Abumadini and colleagues described drug use patterns among treatment seekers in the eastern region over two decades (1986–2006). In the last decade of the study (1996–2006), half of the study population used amphetamine, 46.5% used cannabis, 22.5% used heroin, 25.5% used alcohol, 7% used sedatives, and less than 6% used volatiles or other unspecified drugs.[16] Thus, opioid users are overrepresented in Saudi addiction TCs, even when adjusting for non-Saudi GCC residents. Almost all patients (91.9%) were admitted once to the TCs, which is unusual for chronic, relapsing and severe illness. However, the short history of TCs in KSA and readmission to another TCs may partially explain this.

Conclusion

Similar to other addiction TCs around the world, Saudi TCs attract more disadvantaged patients in comparison to other treatment modalities. The major drugs used among TC residents are similar to those reported in other inpatient services. However, opioid dependencies were over-represented. Furthermore, the type of drug used differed according to the regions of the residents, which may warrant consideration when planning services for these regions. However, addiction TCs have not been established in most Saudi regions. Future research should focus on the relationship between drug use patterns, resident characteristics, and TC treatment outcomes. Moreover, studies are needed to investigate attributes of Saudi TCs that may affect treatment efficacy.

Table 4: Multivariable logistic regression to predict the drug used.

	AMPH**			OP**			ALC**			HASH**			Two and more		
	OR	P-value	CI	OR	P-value	CI	OR	P-value	CI	OR	P-value	CI	OR	P-value	CI
Age															
20–25(R)*	1			1			1			1			1		
26–30	0.69	0.08	(0.46–1.05)	1.05	0.81	(0.68–1.64)	0.95	0.87	(0.48–1.88)	0.84	0.36	(0.59–1.21)	1.11	0.49	(0.82–1.51)
31–35	0.73	0.15	(0.47–1.12)	2.11	0.00	(1.37–3.26)	1.09	0.82	(0.54–2.17)	0.56	0.01	(0.37–0.85)	1.10	0.58	(0.8–1.51)
36–40	0.37	0.00	(0.21–0.65)	6.27	0.00	(4.01–9.81)	2.15	0.03	(1.1–4.19)	0.53	0.01	(0.33–0.84)	0.46	0.00	(0.32–0.67)
41–45	0.42	0.00	(0.23–0.76)	14.61	0.00	(9.01–23.71)	1.49	0.31	(0.69–3.19)	0.18	0.00	(0.09–0.37)	0.34	0.00	(0.22–0.52)
46–50	0.15	0.00	(0.06–0.38)	28.43	0.00	(16.76–48.23)	2.33	0.03	(1.1–4.92)	0.17	0.00	(0.08–0.38)	0.12	0.00	(0.06–0.22)
>50	0.17	0.01	(0.05–0.58)	18.01	0.00	(9.29–34.94)	3.52	0.01	(1.47–8.45)	0.10	0.00	(0.02–0.44)	0.27	0.00	(0.13–0.54)
Employment															
Unemployed(R)*	1			1			1			1			1		
Employed	1.44	0.03	(1.03–2.01)	0.55	0.00	(0.41–0.75)	1.32	0.21	(0.86–2.01)	0.73	0.07	(0.52–1.02)	1.16	0.25	(0.9–1.48)
Student	0.80	0.65	(0.3–2.09)	0.55	0.25	(0.2–1.51)	1.09	0.91	(0.24–4.88)	1.09	0.82	(0.52–2.27)	1.23	0.53	(0.65–2.3)
Retired	1.11	0.92	(0.14–9.14)	0.21	0.03	(0.05–0.82)	0.84	0.83	(0.18–3.99)	0.74	0.78	(0.09–6)	1.25	0.72	(0.36–4.31)
Area															
Riyadh (R)*	1			1			1			1			1		
Western	0.90	0.67	(0.55–1.47)	3.19	0.00	(2.27–4.49)	0.47	0.02	(0.25–0.87)	1.11	0.63	(0.72–1.73)	0.44	0.00	(0.31–0.62)
Eastern	1.19	0.36	(0.82–1.73)	1.50	0.01	(1.11–2.03)	0.85	0.47	(0.54–1.32)	1.26	0.20	(0.89–1.78)	0.80	0.10	(0.62–1.04)
Southern	1.70	0.03	(1.06–2.73)	0.17	0.00	(0.07–0.4)	0.89	0.76	(0.43–1.84)	1.30	0.28	(0.81–2.09)	1.14	0.48	(0.79–1.65)
Northern	2.26	0.00	(1.29–3.94)	0.49	0.06	(0.23–1.03)	0.99	0.99	(0.43–2.31)	1.40	0.26	(0.78–2.52)	0.71	0.16	(0.44–1.14)
Gulf	0.02	0.00	(0–0.17)	35.11	0.00	(23.06–53.47)	0.93	0.82	(0.51–1.71)	0.17	0.00	(0.08–0.34)	0.13	0.00	(0.08–0.21)
Marital status															
Single(R)*	1			1			1			1			1		
Married	1.42	0.07	(0.97–2.08)	0.71	0.04	(0.52–0.98)	1.28	0.28	(0.81–2.03)	1.04	0.85	(0.71–1.52)	0.87	0.35	(0.66–1.16)
Divorced	0.67	0.24	(0.34–1.31)	0.66	0.04	(0.45–0.98)	1.53	0.13	(0.89–2.66)	0.81	0.47	(0.47–1.42)	1.49	0.03	(1.03–2.15)
Education															
University (R)*	1			1			1			1			1		
Secondary	0.28	0.05	(0.08–1.01)	1.36	0.67	(0.34–5.37)	1.39	0.76	(0.17–11.46)	0.68	0.63	(0.14–3.33)	1.57	0.51	(0.41–6.03)
Intermediate	0.30	0.07	(0.08–1.08)	1.44	0.60	(0.37–5.71)	1.38	0.76	(0.17–11.36)	0.63	0.57	(0.13–3.1)	1.64	0.47	(0.43–6.28)
Primary	0.24	0.03	(0.07–0.9)	1.14	0.85	(0.29–4.54)	2.01	0.52	(0.25–16.43)	0.60	0.54	(0.12–3)	1.87	0.36	(0.48–7.19)
Illiterate	0.53	0.38	(0.13–2.17)	0.59	0.50	(0.13–2.68)	1.06	0.96	(0.1–10.83)	0.76	0.75	(0.14–4.15)	2.00	0.34	(0.48–8.32)
				0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.00	
_Cons* **	0.62	0.49	(0.16–2.38)	0.07	0.00	(0.02–0.31)	0.03	0.00	(0–0.28)	0.44	0.33	(0.09–2.26)	0.51	0.33	(0.13–2)

*R: Reference group.

**AMPH: Amphetamine, OP: Opioids, ALC: Alcohol, HASH: Hash.

***_Cons: constant/intercept.

Authors' contributions

ATA: study design, methodology, field application, discussion writing, and manuscript revision. ATK: study design, methodology, statistical analysis, result writing, and manuscript revision. SFA: study design, methodology, field application, and manuscript revision. MAM: study design, introduction writing, and manuscript revision.

Conflict of interest

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