



Methodological Articles

Psychoactive Substance Use and Perception of Mental Health Status in Inmates of Two Portuguese Prisons

Uso de Substâncias Psicoativas e Percepção do Estado de Saúde Mental em Reclusos de Duas Prisões Portuguesas

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Abstract

Aim: To describe patterns of and associations between psychoactive substance use and perception of mental health status amongst male prisoners.

Method: Participants consisted of 60 male prisoners, with a mean age of 38.5 (SD = 11.0). A standardised interview with three sections was carried out: 1) socio-demographic variables, 2) perception of mental health status by CORE-OM, 3) evaluation of psychoactive substance use and dependence (tobacco, alcohol, and illegal drugs).

Results: The majority of the participants reported using a named psychoactive substance during the current detention period. Substance use and addiction tended to be higher amongst the younger men and those who had achieved a higher education. A minority perceived their mental health as good. Self-reported low and mild impairment of mental health is higher in participants who achieved a higher education level and, moderate and severe impairment is higher in lower educated participants. The perceived impairment appeared to be less severe in smokers and alcohol users.

Conclusion: This study highlights the need for a better understanding of the underlying causes and subsequent consequences of the high prevalence of inmate's psychoactive substances use, as well as the better perception of mental health status in those who consume psychoactive substances.

Keywords: inmate's health, psychoactive substance use in prisons, perceived mental health status of prisoners, CORE-OM

Resumo

Objetivo: Descrever padrões e associações entre o uso de substâncias psicoativas e a percepção do estado de saúde mental em reclusos do sexo masculino.

Método: A amostra integrou 60 reclusos do sexo masculino, com média de idade de 38,5 (DP = 11,0). Foi realizada uma entrevista padronizada com três seções: 1) dados sociodemográficos, 2) percepção do estado de saúde mental avaliado pelo CORE-OM, 3) avaliação do uso e dependência de substâncias psicoativas (tabaco, álcool e drogas ilícitas).

Resultados: A maioria dos participantes relatou o uso de uma determinada substância psicoativa durante o atual período de detenção. O uso de substâncias e a dependência tendiam a ser mais elevados entre os homens mais jovens e com mais escolaridade. Uma minoria classificou a sua saúde mental como boa. Na auto-avaliação de saúde mental os níveis baixos e moderados surgiram com maior frequência nos participantes mais escolarizados, sendo que a percepção de estado saúde mental moderado e grave foi mais frequente em participantes com menor escolaridade. A auto-avaliação do estado de saúde mental percecionado parece ser menos grave em participantes que fumam e que consomem álcool.

Conclusão: Este estudo destaca a necessidade de um melhor entendimento das causas subjacentes e consequências da alta prevalência de uso de substâncias psicoativas pelos reclusos, bem como uma melhor compreensão do estado de saúde mental nesta população, especialmente no subgrupo dos consumidores de substâncias psicoativas.

Palavras-Chave: saúde do recluso, uso de substâncias psicoativas nas prisões, percepção do estado de saúde mental dos reclusos, CORE-OM

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A high prevalence of mental health disorders and infectious diseases have been reported in prisons (Bjørngaard, Rustad, & Kjelsberg, 2009) and poor living conditions is an important exacerbating factor. Inmates are often subjected to violence, lack of privacy, limited stimulating activities, and isolation from family and friends. Furthermore, the uncertainty of life following prison release, overcrowding, and lack of adequate health services potentiate these problems (Fellner, 2006).

In Europe, out of two million prisoners at least 400.000 suffer from a significant mental health disorder (World Health Organization [WHO], 2007). A retrospective study, with 671 offenders admitted to a short-term detention facility, concluded that the vast majority of them suffered from some type of mental health disorder, 61% of whom received at least one diagnosis (Lafortune, 2010). A revision and meta-analysis carried out in 24 countries worldwide reported the presence of psychotic and major depression disorders on one in every seven inmates (Fazel & Seewald, 2012).

Additionally, in prisons there is a high co-morbidity of psychiatric disorders and substance abuse. A recent prospective longitudinal study stated that 27% of males had coexisting psychiatric disorders 5 years after detention, with substance abuse and behavioural disorders affecting 1 in every 6 people (Abram et al., 2015). The WHO estimated that 60% to 65% of prisoners suffered from a mental health problem and/or drug dependence, and that between 10% and 48% were using drugs regularly (WHO, 2007). In fact, the lifetime prevalence of psychiatric co-morbidity among drug users in prisons is two to three times higher than in the general population (WHO, 2007).

Smoking is very prevalent amongst patients with mental health disorders. Research suggested that Americans with mental illnesses are 70% more likely to smoke than the general population and are less likely to quit (Gfroerer et al., 2013). In prisons, the scenario is similar. Previous studies which were carried out in United States of America (USA), Australia and Europe found a smoking prevalence of 64 to 91.8% amongst inmates, which corresponds to a number three times higher than the general population (Ritter, Stover, Levy, Etter, & Elger, 2011). The Portuguese general population showed the lowest smoking prevalence in Europe, with 64% saying they have never smoked (Directorate-General Health and Consumers [SANCO], 2007). However, there is no report about smoking prevalence in prisons, making this present study the first one reporting on this data.

Alcohol is a causal factor in over 60 types of disease and injury and accounts for 6.4% of all deaths in Europe (Rehm et al., 2009). Furthermore, alcohol problems often coexist with drug misuse and mental health problems. In most European countries, the consumption of alcohol is common amongst the adult population (over 15

years old), with 80% to 95% drinking at least occasionally (Global Information System on Alcohol and Health [GISAH], 2012). In 2014, the prevalence of alcohol-induced disorders was 7.5% in Europe and 5.8% in Portugal (WHO, 2014). Crime and alcohol are strongly linked, particularly regarding violent crime, which is evident in all European countries. Alcohol-related crimes are both common and expensive: in 2003, such crimes were estimated to cost 33 billion Euros in Europe (Anderson & Baumberg, 2006). Alcohol-related crime is associated with a wide range of social offences, including antisocial behaviour causing social nuisance, vandalism, drink-driving, robbery, sexual offences, assaults, and homicide. Previous findings amongst inmate populations in the USA have documented that alcohol dependence is the most prevalent substance use disorder, with almost a third (29%) meeting the diagnostic criteria (Hoffmann, 2002). Surveys in United Kingdom revealed 19% of 13,000 prisoners had an alcohol problem when they entered the prison, rising to 30% for young adults (Community Justice Portal, 2010). In Portugal, as far as we know, there have never been surveys carried out concerning alcohol use or alcohol intervention programs in prisons. The current study will be the first one reporting this kind of data.

The prevalence of illegal drug use and drug related problems in prisons has been widely reported in a number of countries (Fazel, Bains, & Doll, 2006; WHO, 2005). Hiller and colleagues (1999) reported that in the USA, 68% of all new admissions test positive for an illegal drug in urine screening. In Europe, 1% of the adult population in prisons is using a drug on a daily basis (European Monitoring Centre for Drugs and Drug Addiction [EMCDDA], 2012). The use of new psychoactive substances such as smoking of synthetic cannabinoids in prisoners is a new and emerging problem identified in around two thirds of European countries (EMCDDA, 2017). In Portugal, a recent report stated that 69% of the inmates have already used some drug in their lives and 30% during their present internment (Direção de Serviços de Monitorização e Informação [Direction of Monitoring and Information Services], 2014). When compared to other European countries, Portugal has one of the lowest rates of drug use amongst the general population, except for heroin. Cannabis was the most frequently used illicit drug, followed by MDMA/ecstasy and cocaine (EMCDDA, 2017). Since decriminalisation of the personal use and possession of all drugs in 2001, the number of people arrested and sent to criminal courts for drug offenses declined by more than 60% (Murkin, 2014). However, the drug issue is strongly correlated to detention.

It is known that improving the mental health status and reducing psychoactive substance abuse can help to decrease emotional distress and to increase resilience (Rutter, 1985). However, within the specific context of prisons, there is not much information about mental health status, psychoactive substance use, and the relationship between them. In this context, the goal of this study is to describe patterns of psychoactive substance misuse and perceived mental health status and to study associations between these variables.

Method

Study Design

This was an observational, cross-sectional, and quantitative study with a convenience sample, carried out in May 2010. The socio-demographic variables included age, tobacco, alcohol and illegal drug use, tobacco dependence, alcohol use risks, and perceived mental health status.

Population and Sample

The study population consisted of 185 inmates from two Correctional Facilities (CF) located in the Beira Interior region. One of the CF is a medium security unit and has a medium management complexity. It has a maximum capacity for 105 males and holds an average of 61 on any given month. The other CF is a high surveillance male only unit and also has a medium management complexity. The majority of the inmates committed theft, robbery, and trafficking, and were given a varying verdict from 3 to 6 years.

The sample included 60 prisoners (32.0% of the total population), the maximum permitted by the authorisation of the Justice Ministry. All individuals were male with mean age of 38.45 years ($SD = 11.0$), ranging from 22 to 64 years old and one quarter of the population was non-national.

The study was approved by the Justice Minister and by the Ethics Board of the Health Sciences Faculty – Beira Interior University.

Setting

Portugal is a Southern European country characterised by generous universal public health coverage and a rehabilitative perspective on criminal justice. The longest penalty in Portugal is 25 years. In the year of this study, the average number of registered inmates in Portugal was 11674, the prison occupancy rate was near 100% and the number of prison officers was decreasing. In 2010, death amongst inmates was reported at a rate of 50 per 1000, doubling the reported figures in other European countries (Santos, 2010).

The current study was conducted in two CF in the Beira Interior region. This region constitutes a 12740 km² area of Portugal with 383.995 inhabitants, corresponding to a population density of 29,1 habitants/km² (Instituto Nacional de Estatística - INE [Statistics Portugal], 2011). This region is predominantly rural with some textile industries, and with an unemployment rate above 10%. The majority of the crimes judged in this region were crimes against people (Santos, Marques, Pedroso, & Ferreira, 1996).

Measures

Sociodemographic Data

Sociodemographic variables were age and educational level. Considering that data analysis could be compromised by the small sample size, the variable age was categorised into two groups: 18 to 35 years old and more than 35 years old. The education level included the following categories: illiterate, can read and write, first cycle of basic education, second cycle of basic education, secondary education, and higher education. The respondents were also re-distributed into three groups: until the first cycle of basic education, second cycle of basic education, and higher than second cycle of basic education.

Psychoactive Substance Use

Participants were questioned about the current use of tobacco and/or alcohol. It was also asked if they use illicit drugs such as cocaine, ecstasy, hashish, heroin, LSD, and marijuana.

Tobacco Dependence and Alcohol Dependence Evaluation

The evaluation of tobacco dependence was performed by Fagerström Nicotine Dependence Test (FNDDT) (Heatherton, Kozlowski, Frecker, & Fagerström, 1991), a revision of the initial Fagerström Tolerance Questionnaire

already validated for the Portuguese population (Ferreira, Quintal, Lopes, & Taveira, 2009). This test included six questions that assess different aspects of smoking behaviour. The total score ranges from 0 to 10, with a higher score indicating greater nicotine dependence. The marks have been shown to correlate with biochemical measures of nicotine intake, years of smoking, severity of nicotine withdrawal following abstinence, and success with quitting (Rush & Blacker, 2002). Several studies have shown reasonable reliability and internal consistency of the FNDT (Etter, Duc, & Perneger, 1999; Pomerleau, Carton, Lutzke, Flessland, & Pomerleau, 1994). This instrument is the most widely used measure of nicotine dependence in the literature because of its ease of use (Rios-Bedoya, Snedecor, Pomerleau, & Pomerleau, 2008).

Use of alcohol, risks of alcohol use, and alcohol dependence were assessed using the Alcohol Use Disorders Identification Test (AUDIT) (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001), a tool developed by the WHO, published in 2001 and validated for the Portuguese population in 2002 (Cunha, 2002). It is a short, easy, and fast questionnaire with only 10 items. The instrument comprises of three domains: alcohol consumption (frequency, typical quantity, and frequency of heavy drinking), dependence symptoms (impaired control over drinking, morning drinking, and increased salience of drinking) and problems associated with harmful use (guilt after drinking, blackouts, alcohol-related injuries, others concerned about drinking). The AUDIT yields a score ranging from 0 to 40 and the total score is interpreted in three categories: no alcohol-related risk (0-7); risk of alcoholism (8-12); and alcoholism and problems associated with harmful use (13-50), with 92% of sensibility and 94% of specificity. The AUDIT has good psychometric proprieties, namely reliability (test-retest reliability and internal consistency), validity (content and construct, predictive and convergent) and normative criteria (Sobell, Toneatto, & Sobell, 1994). The AUDIT has been considered more accurate than CAGE and Michigan Alcohol Screening Test (MAST) or than their multiple adaptations (Bradley, Boyd-Wickizer, Powell, & Burman, 1998; MacKenzie, Langa, & Brown, 1996; Seppä, Mäkelä, & Sillanaukee, 1995).

Perceived Mental Health Status

The mental health status was measured using the Clinical Outcome Routine Evaluation-Outcome Measure (CORE-OM) (Evans et al., 2000), a European self-report measure of psychological well-being in adults, which is already adapted in more than 20 countries. It is used in primary care, occupational health, and for evaluating the quality of mental health services (Barkham, Gilbert, Connell, Marshall, & Twigg, 2005). This instrument is a 34-item generic measure of psychological distress and comprises four domains: subjective well-being (4 items), complaints and symptoms (12 items), social and personal functioning (12 items) and risk behaviours (6 items). Each domain contains equal numbers of high and low intensity/severity items to offset possible floor and ceiling effects.

All items are scored on a five-point Likert scale (from 0 to 4, anchored “not at all”, “sometimes”, “often”, “only occasionally” and “all or most of the time”) and relate to the previous week. The total score is divided in six levels of distress: healthy (1-20), low level (21-33), mild (34-50), moderate (51-67), moderate to severe (68-84) and severe (85-136) (Gray & Mellor-Clark, 2007). In this study, due to the low number of participants, the final score was divided into three categories: good mental health (1-20), impairment of mental health low and mild (21-50) and moderate and severe (51-136). Studies have shown high internal reliabilities (Barkham et al., 2005; Evans et al., 2002). Sales, Moleiro, Evans, and Alves (2012) examined 111 Portuguese individuals using the CORE-OM and reported that it is a valid and reliable measure for the Portuguese population. We used their version of the CORE-OM.

Procedure

A meeting was convened where all the inmates were invited to participate voluntarily in the study. Those who accepted were first asked to complete an anonymous questionnaire. All participants gave their informed consent and were not paid for their participation. The only exclusion criterion was being illiterate.

Data Analysis

Firstly, the demographic data was analysed through its descriptive statistics: frequencies, percentages, minimum, maximum, mean (*M*), standard deviation (*SD*).

Secondly, the association between use of psychoactive substances and socio-demographic characteristics was verified. Differences in the measure scores among socio-demographic groups were examined by chi-square (χ^2) test. Associations between perceived mental health status and consumption of psychoactive substances was examined by t-student. The assumptions for statistical tests weren't done due the sample specificities.

The statistical significance accepted was for p -value $\leq .05$. Missing responses were replaced with the median of the sample, due the small dimension of that. All the data were analysed with IBM SPSS Statistics for Windows (Version 22.0; IBM Corp., 2013).

Results

Socio-Demographic Data

The study population consisted of 185 inmates from two CF. The sample included 60 inmates (32%) who agreed to voluntary participate in this project. All subjects were male, aged between 22 and 64 years ($M = 38.5$, $SD = 11.0$), and the majority of them had some degree of education: 38.4% had achieved the second cycle of basic education, 36.6% had achieved more than that, and 25% had the first cycle of basic education.

Psychoactive Substance Use

The majority of the participants divulged some degree of substance misuse. The most common substance was tobacco (78.3%), followed by alcohol (68.9%), hashish (53.3%), marijuana (48.3%), cocaine (45%), and heroin (45%).

The percentage of young smokers (85.7%) was higher than the percentage of older ones (71.8%), but this difference was not statistically significant ($\chi^2(1, N = 60) = 1.69, p = .19$). Younger men also had a higher prevalence of alcohol misuse (77.4%), though with no significant difference ($\chi^2(1, 60) = 2.2; p = .14$). The same was identified amongst young drug users (75.0%), however there was still no significant differences between the two age groups ($\chi^2(1, N = 60) = 2.31, p = .13$).

Participants with a higher education were more likely to smoke (86.4%), drink alcohol (86.4%), and take drugs (81.8%). However, no significant difference was found between educational groups for each substance use (Table 1) – smoking ($\chi^2(2, N = 47) = 2.04, p = .36$), drinking alcohol ($\chi^2(2, N = 40) = 5.39, p = .07$) and taking drugs ($\chi^2(2, N = 39) = 5.12, p = .08$).

Table 1

Sociodemographic Characteristics and Substance Use

Characteristic	Smokers <i>n</i> (%)	<i>p</i>	Alcohol users <i>n</i> (%)	<i>p</i>	Drug users <i>n</i> (%)	<i>p</i>
Total population	47 (78.3)		40 (68.9)		39 (65.0)	
Age		.19		.14		.13
18-35	24 (85.7)		24 (77.4)		21 (75.0)	
>35	23 (71.8)		16 (59.3)		18 (56.3)	
Education		.36		.07		.08
< basic 2nd cycle	10 (66.7)		9 (64.3)		7 (46.7)	
= Basic 2nd cycle	18 (78.3)		12 (54.4)		14 (60.9)	
> basic 2nd cycle	19 (86.4)		19 (86.4)		18 (81.8)	

Nicotine and Alcohol Dependence Risk

The majority of smokers had mild nicotine dependence, though with no significant difference between the two age groups ($\chi^2(3, N = 47) = 2.44, p = .49$). Participants with a low education level had preferably low nicotine dependence (33.3%), in contrast to participants with higher education, who rather had mild nicotine dependence, with significant difference between these groups ($\chi^2(6, N = 47) = 12.94, p = .04$).

More participants had no risk of dependence on alcohol (38.0%) than the other two categories (risk of alcohol dependence and alcoholism risk and problems associated with harmful use). For both age groups, this category also represented the highest percentage of individuals, with no significant difference between them ($\chi^2(3, N = 40) = 3.76, p = .29$). The majority (50.0%) of alcohol users without dependence risk had high education level and users with alcoholism risk and problems associated with harmful use had preferably the lowest level of education (28.6%), though there was no significant difference ($\chi^2(6, N = 40) = 8.70, p = .19$) (Table 2).

Table 2

Sociodemographic Characteristics and Nicotine and Alcohol Dependence

Characteristic	Nicotine Dependence <i>n</i> (%)			<i>p</i>	Risk of Alcohol Dependence <i>n</i> (%)			<i>p</i>
	Low	Mild	High		No risk	Risk	Harmful use	
Total population	8 (13.3)	32 (53.3)	7 (11.7)		22 (38.0)	9 (15.5)	9 (15.5)	
Age				.49				.29
18-35	3 (10.7)	17 (60.7)	4 (14.3)		7 (25.9)	5 (18.5)	4 (14.8)	
>35	5 (15.6)	15 (46.9)	3 (9.4)		15 (48.4)	4 (12.9)	5 (16.1)	
Education				.04				.19
< basic 2nd cycle	5 (33.3)	4 (26.7)	1 (6.7)		4 (28.6)	1 (7.1)	4 (28.6)	
= Basic 2nd cycle	0 (0.0)	14 (60.9)	4 (17.4)		7 (31.8)	3 (13.6)	2 (9.1)	
> basic 2nd cycle	3 (13.6)	14 (63.6)	2 (9.1)		11 (50.0)	5 (22.7)	3 (13.6)	

Description of Perceived Mental Health

The majority of the participants (68.3%) had a low level of mental health impairment, encompassing 75.0% of the younger participants and 62.5% of the older ones. The impairment of mental health appeared to be more severe in older participants (21.9%) than in younger ones (14.3%). Only 13.3% of the participants had a self-

evaluation of mental health that they considered good, which was slightly higher in older ones (15.6%). However, there was no significant difference ($\chi^2(2, N = 60) = 1.08, p = .58$).

For all levels of education, the majority of participants presented low and mild mental health impairment. However, more participants with lower education level (33.3%) had worst mental health impairment, though this difference was not statistically significant ($\chi^2(4, N = 60) = 3.64, p = .46$) (Table 3).

Table 3

Sociodemographic Characteristics and Perceived Mental Health (CORE-OM)

Characteristic	Mental Health, <i>n</i> (%)			<i>p</i>
	Good	Low and mild impairment	Moderate and severe impairment	
Total population	8 (13.3)	41 (68.3)	11 (18.3)	
Age				.58
18-35 years	3 (10.7)	21 (75.0)	4 (14.3)	
> 35 years	5 (15.6)	20 (62.5)	7 (21.9)	
Education				.46
< basic 2nd cycle	2 (13.3)	8 (53.3)	5 (33.3)	
= Basic 2nd cycle	3 (13.0)	16 (69.6)	4 (17.4)	
> basic 2nd cycle	3 (13.6)	17 (77.3)	2 (9.1)	

Relation Between Psychoactive Substance Use and Perceived Mental Health Status

Most of the smokers (78.7%) and non-smokers (92.3%) showed a status of impaired mental health (range low and mild). Non-smokers had a higher score in the CORE-OM ($M = 42.9, SD = 12.4$), meaning a lower perceived mental health status than smokers ($M = 36.8, SD = 15.8$), but this difference was not statistically significant ($t(58) = 1.27, p = .21$).

A similar result was found regarding alcohol users: most of alcohol users (65%) and non-users (83.3%) showed an impaired mental health (range low and mild). Non-alcohol users had a higher score in the CORE-OM ($M = 40.6, SD = 14.6$), meaning a lower perceived mental health status than alcohol users ($M = 37.0, SD = 16.0$), though this difference was not statistically significant ($t(56) = 0.83, p = .41$).

Regarding the use of illegal drugs, most of users (82.0%) and non-users (81.0%) presented an impairment of mental health (range low and mild). The CORE-OM scores were similar for both groups: illegal drug users ($M = 38.4, SD = 15.8$); non-users ($M = 37.7, SD = 14.7$; $t(58) = -0.17, p = .87$) (Table 4).

Table 4

Association Between Perceived Mental Health (CORE-OM) and Psychoactive Substance Use/Misuse

Group	Mental Health, <i>n</i> (%)			<i>M</i> (<i>SD</i>)	<i>p</i>
	Good	Low and mild impairment	Moderate and severe impairment		
Tobacco					.21
Smokers	7 (14.9)	37 (78.7)	3 (6.4)	36.8 (15.8)	
Non-smokers	1 (7.7)	12 (92.3)	0 (0.0)	42.9 (12.4)	
Alcohol					.41
User	6 (15.0)	32 (65.0)	2 (20.0)	37.0 (16.0)	
No user	2 (11.1)	15 (83.3)	1 (5.6)	40.6 (14.6)	
Illegal drugs					.87
User	4 (10.3)	32 (82.0)	3 (7.7)	38.4 (15.8)	
Non-user	4 (19.0)	17 (81.0)	0 (0.0)	37.7 (14.7)	

Discussion

In this study, the majority of prisoners used substances during their detention. Tobacco was the most used substance, followed by alcohol and illegal drugs. Hashish was the most used illegal drug followed by marijuana, cocaine, and heroin.

These results are comparable to previous published studies (Fazel et al., 2006; Hoffmann, 2002; Ritter et al., 2011). A report collecting data of drug use among prisoners in the European Union indicated that one-third of prisoners show problematic drug-use patterns (EMCDDA, 2012). As in this study, cannabis was the illicit drug with the highest reported level of lifetime prevalence among prisoners, followed by cocaine, amphetamines, and heroin. A recent Portuguese report stated that 69% of the inmates had already used some psychoactive illegal drug during their lives, and 30% used some illegal drug during their present detention. As in this study, cannabis was the most commonly used drug, in their lives (56%) or during their current detention (28%). In the current study, the use of other substances was lower than we have found in our study (10%), cocaine being the most common, followed by heroin and hypnotics/sedatives without prescription (DSMI, 2014).

The high use of psychoactive substances may be explained by many factors. Firstly, it is noteworthy that all participants were male, who tend to report higher prevalence of psychoactive substance use (EMCDDA, 2009; Jamal et al., 2016). Secondly, the majority of participants were young ($M = 38.5$ years) which is also often associated with higher levels of substance abuse (Anderson & Baumberg, 2006; Torres, 2007). Overcrowded prisons may be another factor, as it creates a stressful environment and a difficulty to control impulses, subsequently leading to the escapism that drug use may offer (Direcção de Estabelecimentos Prisionais [Department of Corrections], 2011; Fernandes & Silva, 2009). The association between drug use, poverty, and reclusion might also account for these results (Torres, 2007).

Our results suggest that participants with higher educational level had higher substance use and dependence. The same was shown in other studies where individuals with higher levels of education, smoke more and have a higher alcohol intake (Evans et al., 2002; Levy, Mumford, & Compton, 2006; Lopes, Andreozzi, Ramos, &

Carvalho, 2008). However, the opposite has been found, where individuals with low education use more psychoactive substances (Adlaf, Ialomiteanu, & Rehm, 2011; Crum & Anthony, 2000; Fernandes & Silva, 2009; INE, 2011). Higher levels of psychoactive substance use amongst the higher educated could be explained by the atypical setting where this study was conducted. In prisons, the use of psychoactive substances could be associated with higher social status, which happens less often amongst the general population.

The majority of the inmates evaluated their mental health status as low and mild impairment. Only a minority perceived their mental health level as good. The impairment of mental health appeared to be more severe in older men and in those with lower levels of education. Those who smoked and misused alcohol had a better mental health impairment self-assessment. However, these results were not always significant. Nonetheless, it suggests the possibility of an association between substance use and better self-rated mental health. This relationship raises some questions about the false perception of mental health status in those who misuse substances. Many prisoners have a low level of education, experience social and family marginalization, and have a low IQ, while few achieve a professional qualification. These factors can explain their distorted self-evaluation (HM Inspectorate of Prisons, 2000; Portugal, Health and Justice Ministry, 2006). A 2006 report showed that young prisoners, with preferential cocaine use and polydrug use (hashish, ecstasy, cocaine, LSD, alcohol) didn't consider themselves addicts. Therefore, they didn't seek treatment to tackle their addiction (Portugal, Health and Justice Ministry, 2006). Furthermore, addictive substances, especially tobacco, are considered to be part of the prison culture. Cigarettes serve as a currency in prisons and are seen as a symbol of freedom in a group with few rights and privileges. Tobacco also helps to reduce stress during prison transfers and court hearings (Richmond et al., 2009).

However, other studies have concluded the opposite: substance abuse is associated with worse mental health, following epidemiological or clinical diagnostic criteria (Cuijpers, Smit, Have, & de Graaf, 2007; Farrell et al., 2003; Martínez-Ortega, Jurado, Martínez-González, & Gurpegui, 2006; Regier et al., 1990). However, an important difference between those studies and the present one is that the mental health was self-rated by the prisoners in the current study.

This study has some limitations. The small sample size has conditioned some analysis and may have led to type II error. The representativeness of the sample is weak as the data collected was just from two prisons and included only males, which does not allow the generalisation of the results to the national inmates' population. The cross-sectional nature of the study does not permit evaluate the risk and protective factors for substances use or inferences on the direction of the relationships between variables or to detect fluctuations in the behaviours and in perceived mental health of prisoners. Finally, another important factor of bias was the data collection based on self-reporting.

Nevertheless, results of this study are relevant towards better understanding the causes and consequences of the high prevalence of inmate's psychoactive substance use, as well as the conceivably false perception of better mental health in those who consume psychoactive substances. These results highlight the need to develop treatment programs and policies to tackle substance abuse in Portuguese prisons. Moreover, future studies should also focus in new synthetic drugs of abuse, particularly the so-called amphetamine-type stimulants which have been recurrently present in recent studies of prison population's substance use in Europe, with a devastating impact.

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References

- Abram, K. M., Zwecker, N. A., Welty, L. J., Hershfield, J. A., Dulcan, M. K., & Teplin, L. A. (2015). Comorbidity and continuity of psychiatric disorders in youth after detention: A prospective longitudinal study. *JAMA Psychiatry*, *72*(1), 84-93. doi:10.1001/jamapsychiatry.2014.1375
- Adlaf, E., Ialomiteanu, A., & Rehm, J. (2011). *Addiction and mental health indicators among Ontario adults, 1977-2005*. Toronto, Canada: Centre for Addiction and Mental Health.
- Anderson, P., & Baumberg, B. (2006). *Alcohol in Europe: A public health perspective*. London, United Kingdom: Institute of Alcohol Studies.
- Babor, T. F., Higgins-Biddle, J. C., Saunders, J. B., & Monteiro, M. G. (2001) *The Alcohol Use Disorders Identification Test: Guidelines for use in primary care* (2nd ed., WHO/MSD/MSB/01.6a). Retrieved from http://www.talkingalcohol.com/files/pdfs/WHO_audit.pdf
- Barkham, M., Gilbert, N., Connell, J., Marshall, C., & Twigg, E. (2005). Suitability and utility of the CORE-OM and CORE-A for assessing severity of presenting problems in psychological therapy services based in primary and secondary care settings. *The British Journal of Psychiatry*, *186*, 239-246. doi:10.1192/bjp.186.3.239
- Bjørngaard, J. H., Rustad, Å. B., & Kjelsberg, E. (2009). The prisoner as patient – A health services satisfaction survey. *BMC Health Services Research*, *9*, Article 176. doi:10.1186/1472-6963-9-176
- Bradley, K. A., Boyd-Wickizer, J., Powell, S. H., & Burman, M. L. (1998). Alcohol screening questionnaires in women: A critical review. *JAMA*, *280*, 166-171. doi:10.1001/jama.280.2.166
- Community Justice Portal. (2010). *Prison service failing to address growing problem of alcohol misuse in prisons*. London, United Kingdom: Prison Reform Trust.
- Crum, R. M., & Anthony, J. C. (2000). Educational level and risk for alcohol abuse and dependence: Differences by race-ethnicity. *Ethnicity & Disease*, *10*(1), 39-52.
- Cuijpers, P., Smit, F., Have, M., & de Graaf, R. (2007). Smoking is associated with first-ever incidence of mental disorders: A prospective population-based study. *Addiction*, *102*, 1303-1309. doi:10.1111/j.1360-0443.2007.01885.x
- Cunha, J. (2002). *Validação da versão portuguesa dos Questionários AUDIT e Five-Shot para identificação de consumo excessivo de álcool*. Lisbon, Portugal: Internato Complementar de Clínica Geral da Zona Sul.

- Direção de Serviços de Monitorização e Informação [DSMI] [Direction of Monitoring and Information Services]. (2014). *Relatório Anual: A Situação do País em Matéria de Drogas e Toxicodependências* [Annual Report: The country situation in drugs and dependences]. Lisbon, Portugal: Serviço de Intervenção nos Comportamentos Aditivos e nas Dependências.
- Direcção de Estabelecimentos Prisionais [Department of Corrections]. (2011). *Distribuição dos Reclusos por Situação Penal, Sexo e Tipo de Estabelecimento / Lotação e Taxa de Ocupação* [Distribution of inmates by criminal status, sex and establishment type/ capacity and occupancy rate]. Lisbon, Portugal: DSPR Externas.
- Directorate-General Health and Consumers (SANCO). (2007). *Attitudes towards alcohol* (Special Eurobarometer272b/Wave66.2). Retrieved from http://ec.europa.eu/public_opinion/archives/ebs/ebs_331_en.pdf
- Etter, J.-F., Duc, T. V., & Perneger, T. V. (1999). Validity of the Fagerström test for nicotine dependence and of the Heaviness of Smoking Index among relatively light smokers. *Addiction*, *94*, 269-281. doi:10.1046/j.1360-0443.1999.94226910.x
- European Monitoring Centre for Drugs and Drug Addiction (EMCDDA). (2009). *Annual report 2009: The state of the drugs problem in Europe*. Luxembourg, Luxembourg: Publications Office of the European Union.
- European Monitoring Centre for Drugs and Drug Addiction (EMCDDA). (2012). *Annual report 2012: The state of the drugs problem in Europe*. Luxembourg, Luxembourg: Publications Office of the European Union.
- European Monitoring Centre for Drugs and Drug Addiction (EMCDDA). (2017). *European Drug Report: Trends and developments*. Luxembourg, Luxembourg: Publications Office of the European Union.
- Evans, C., Connell, J., Barkham, M., Margison, F., McGrath, G., Mellor-Clark, J., & Audin, K. (2002). Towards a standardised brief outcome measure: Psychometric properties and utility of CORE-OM. *The British Journal of Psychiatry*, *180*, 51-60. doi:10.1192/bjp.180.1.51
- Evans, C., Mellor-Clark, J., Margison, F., Barkham, M., Audin, K., Connell, J., & McGrath, G. (2000). CORE: Clinical Outcomes in Routine Evaluation. *Journal of Mental Health*, *9*, 247-255. doi:10.1080/713680250
- Farrell, M., Howes, S., Taylor, C., Lewis, G., Jenkins, R., Bebbington, P., . . . Meltzer, H. (2003). Substance misuse and psychiatric comorbidity: An overview of the OPCS National Psychiatric Morbidity Survey. *International Review of Psychiatry*, *15*(1-2), 43-49. doi:10.1080/0954026021000045930
- Fazel, S., Bains, P., & Doll, H. (2006). Substance abuse and dependence in prisoners: A systematic review. *Addiction*, *101*, 181-191. doi:10.1111/j.1360-0443.2006.01316.x
- Fazel, S., & Seewald, K. (2012). Severe mental illness in 33,588 prisoners worldwide: Systematic review and meta-regression analysis. *The British Journal of Psychiatry*, *200*, 364-373. doi:10.1192/bjp.bp.111.096370
- Fellner, J. (2006). A corrections quandary: Mental illness and prison rules. *Harvard Civil Rights-Civil Liberties Law Review*, *41*, 391-412.
- Fernandes, L., & Silva, M. (2009). *O que a droga fez à prisão: Um percurso a partir das terapias de substituição opiácea*. Lisbon, Portugal: Instituto da Droga e da Toxicodependência.

- Ferreira, P. L., Quintal, C., Lopes, I., & Taveira, N. (2009). Teste de dependência à nicotina: Validação linguística e psicométrica do teste de Fagerström. *Revista Portuguesa de Saude Publica*, 27(2), 37-56.
- Gfroerer, J., Dube, S. R., King, B. A., Garrett, B. E., Babb, S., & McAfee, T. (2013). Vital signs: Current cigarette smoking among adults aged ≥18 years with mental illness — United States, 2009–2011. *Morbidity and Mortality Weekly Report (MMWR)*, 62, 81-87.
- Global Information System on Alcohol and Health (GISAH). (2012). [Geneva, Switzerland: World Health Organization]. Retrieved from <http://www.who.int/gho/alcohol/en/index.html>
- Gray, P., & Mellor-Clark, J. (2007). *CORE: A decade of development*. Rugby, United Kingdom: CORE IMS.
- Heatheron, T. F., Kozlowski, L. T., Frecker, R. C., & Fagerström, K. O. (1991). The Fagerström Test for Nicotine Dependence: A revision of the Fagerström Tolerance Questionnaire. *British Journal of Addiction*, 86, 1119-1127. doi:10.1111/j.1360-0443.1991.tb01879.x
- Hiller, M. L., Knight, K., & Simpson, D. D. (1999). Prison-based substance abuse treatment, residential aftercare and recidivism. *Addiction*, 94, 833-842. doi:10.1046/j.1360-0443.1999.9468337.x
- HM Inspectorate of Prisons. (2000). *Unjust deserts: A thematic review of the treatment and conditions for unsentenced prisoners in England and Wales*. London, United Kingdom: Home Office.
- Hoffmann, N. G. (2002). *Annual Report 2002: Diagnosis of substance use disorders*. Smithfield, RI, USA: Evinced Clinical Assessments.
- IBM Corporation. (2013). IBM SPSS Statistics for Windows [Computer software]. Armonk, NY, USA: IBM Corp.
- Instituto Nacional de Estatística (INE) [Statistics Portugal]. (2011). *Anuário Estatístico da Região Centro*. Lisbon, Portugal: INE.
- Jamal, A., King, B. A., Neff, L. J., Whitmill, J., Babb, S. D., & Graffunder, C. M. (2016). Current cigarette smoking among adults—United States, 2005–2015. *Morbidity and Mortality Weekly Report (MMWR)*, 65, 1205-1211. doi:10.15585/mmwr.mm6544a2
- Lafortune, D. (2010). Prevalence and screening of mental disorders in short-term correctional facilities. *International Journal of Law and Psychiatry*, 33, 94-100. doi:10.1016/j.ijlp.2009.12.004
- Levy, D. T., Mumford, E. A., & Compton, C. (2006). Tobacco control policies and smoking in a population of low education women, 1992-2002. *Journal of Epidemiology and Community Health*, 60(Suppl 2), ii20-ii26. doi:10.1136/jech.2005.045542
- Lopes, C., Andreozzi, V. L., Ramos, E., & Carvalho, M. S. (2008). Modelling over week patterns of alcohol consumption. *Alcohol & Alcoholism*, 43, 215-222. doi:10.1093/alcalc/agm151
- MacKenzie, D., Langa, A., & Brown, T. M. (1996). Identifying hazardous or harmful alcohol use in medical admissions: A comparison of AUDIT, CAGE and Brief MAST. *Alcohol & Alcoholism*, 31, 591-599. doi:10.1093/oxfordjournals.alcalc.a008195
- Martínez-Ortega, J. M., Jurado, D., Martínez-González, M. A., & Gurpegui, M. (2006). Nicotine dependence, use of illegal drugs and psychiatric morbidity. *Addictive Behaviors*, 31, 1722-1729. doi:10.1016/j.addbeh.2005.12.012

- Murkin, G. (2014). *Drug decriminalisation in Portugal: Setting the record straight*. London, United Kingdom: Transform.
- Pomerleau, C. S., Carton, S. M., Lutzke, M. L., Flessland, K. A., & Pomerleau, O. F. (1994). Reliability of the Fagerström Tolerance Questionnaire and the Fagerström Test for Nicotine Dependence. *Addictive Behaviors, 19*, 33-39. doi:10.1016/0306-4603(94)90049-3
- Portugal, Health and Justice Ministry. (2006). *Plano de Acção Nacional para Combate à Propagação de Doenças Infecciosas em Meio Prisional*. Despacho conjunto n.º 72/2006. 2006. Retrieved from http://www.sicad.pt/BK/Publicacoes/Lists/SICAD_PUBLICACOES/Attachments/43/PA_NCPDIEMP.pdf
- Regier, D., Farmer, M. E., Rae, D. S., Locke, B., Keith, S., Judd, L., & Goodwin, F. (1990). Comorbidity of mental disorders with alcohol and other drug abuse: Results from the Epidemiologic Catchment Area (ECA) Study. *JAMA, 264*, 2511-2518. doi:10.1001/jama.1990.03450190043026
- Rehm, J., Mathers, C., Popova, S., Thavorncharoensap, M., Teerawattananon, Y., & Patra, J. (2009). Global burden of disease and injury and economic cost attributable to alcohol use and alcohol-use disorders. *Lancet, 373*, 2223-2233. doi:10.1016/S0140-6736(09)60746-7
- Richmond, R., Butler, T., Wilhelm, K., Wodak, A., Cunningham, M., & Anderson, I. (2009). Tobacco in prisons: A focus group study. *School of Public Health and Community Medicine, 18*, 176-182.
- Ríos-Bedoya, C. F., Snedecor, S. M., Pomerleau, C. S., & Pomerleau, O. F. (2008). Association of withdrawal features with nicotine dependence as measured by the Fagerström Test for Nicotine Dependence. *Addictive Behaviors, 33*, 1086-1089. doi:10.1016/j.addbeh.2008.04.005
- Ritter, C., Stover, H., Levy, M., Etter, J.-F., & Elger, B. (2011). Smoking in prisons: The need for effective and acceptable interventions. *Journal of Public Health Policy, 32*(1), 32-45. doi:10.1057/jphp.2010.47
- Rush, A. J., & Blacker, D. (2002). *Handbook of psychiatric measures*. Washington, DC, USA: American Psychiatric Pub.
- Rutter, M. (1985). Resilience in the face of adversity: Protective factors and resistance to psychiatric disorder. *The British Journal of Psychiatry, 147*, 598-611. doi:10.1192/bjp.147.6.598
- Sales, C., Moleiro, M., Evans, C., & Alves, G. (2012). Versão Portuguesa do CORE-OM: Tradução, adaptação e estudo preliminar das suas propriedades psicométricas. *Archives of Clinical Psychiatry, 39*, 54-59. doi:10.1590/S0101-60832012000200003
- Santos, C. (2010). *Prisões portuguesas sobrelotadas e com condições "miseráveis"*. Lisbon, Portugal: Esquerda.
- Santos, B., Marques, M., Pedroso, J., & Ferreira, R. (1996). *Os Tribunais Nas Sociedades Contemporâneas - O Caso Português*. Lisbon, Portugal: Edições Afrontamento.
- Seppä, K., Mäkelä, R., & Sillanaukee, P. (1995). Effectiveness of the Alcohol Use Disorders Identification Test in occupational health screenings. *Alcoholism: Clinical and Experimental Research, 19*, 999-1003. doi:10.1111/j.1530-0277.1995.tb00980.x
- Sobell, L. C., Toneatto, T., & Sobell, M. B. (1994). Behavioral assessment and treatment planning for alcohol, tobacco, and other drug problems: Current status with an emphasis on clinical applications. *Behavior Therapy, 25*, 533-580. doi:10.1016/S0005-7894(05)80199-6

Torres, A. (2007). *Drogas e Prisões: Portugal 2001-2007*. Lisbon, Portugal: Estudos Universidades.

World Health Organization (WHO). (2005). *Status paper on prisons, drugs and harm reduction*. Retrieved from http://www.euro.who.int/__data/assets/pdf_file/0006/78549/E85877.pdf

World Health Organization (WHO). (2007). *Trenčín statement on prisons and mental health*. Retrieved from http://www.euro.who.int/__data/assets/pdf_file/0006/99006/E91402.pdf

World Health Organization (WHO). (2014). *Global status report on alcohol and health, 2014*. Retrieved from http://apps.who.int/iris/bitstream/10665/112736/1/9789240692763_eng.pdf