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Mental Illness Among 500 Homeless People in Lisboa, Portugal

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ABSTRACT

Introduction: The high burden of mental illness in the homeless is well documented worldwide. In Lisboa, Portugal, a study of 2002 pointed to a worrying prevalence of 96% of mental illness in this population.

Objectives: Our goal was to identify the demographic profile of the mentally ill living as homeless in Lisboa, Portugal, and their relationship with the national healthcare system. We also tried to understand which factors contribute to the number and duration of psychiatric admissions among these homeless.

Methods: We used a cross-sectional design, collecting data for 4 years among homeless people, in Lisboa, Portugal, that were referred as possible mentally ill patients to *Centro Hospitalar Psiquiátrico de Lisboa* (CHPL). In total, we collected data from 500 homeless people, then cross-checked these homeless in our CHPL hospital electronic database and obtained 467 patient matches.

Results: The most common psychiatric diagnosis in our sample was drug abuse (34%), followed by alcohol abuse (33%), personality disorder (24%), and acute stress reaction (23%). Sixty-two percent of our patients had multiple diagnoses, a subgroup with longer follow-ups, more psychiatric hospitalizations, and longer psychiatric hospitalizations. The most striking finding in our study was the high prevalence of psychotic disorders: organic psychosis (17%), schizophrenia (15%), psychosis not otherwise specified (14%), and schizoaffective disorder (11%), that combined altogether were present in more than half (57%) of our homeless patients.

Conclusions: The homeless with multiple diagnoses have higher mental health needs and worse determinants of general health. An ongoing effort is needed to identify and address this subgroup of mentally ill homeless to improve their treatment and outcomes.

Keywords: homeless, mental illness, dual diagnosis, hospitalization, Portugal.

RESUMO

Introdução: *O grande peso da doença mental nos sem-abrigo está bem documentado mundialmente. Em Lisboa, Portugal, um estudo de 2002 indicou uma alarmante prevalência de 96% de doença mental nesta população.*

Objectivos: *Estudar o perfil sociodemográfico dos sem-abrigo com doença mental, em Lisboa, Portugal, e a relação destes com o Sistema Nacional de Saúde português. Tentar compreender que fatores influenciam o número e duração dos internamentos psiquiátricos destes sem-abrigo.*

Métodos: *Realizámos um estudo transversal, recolhendo dados durante 4 anos, entre sem-abrigos, em Lisboa, Portugal, referenciados como possíveis doentes psiquiátricos ao Centro Hospitalar Psiquiátrico de Lisboa (CHPL). Reunimos dados de 500 sem-abrigo, procurámos correspondências de doentes na base de dados eletrónica do CHPL e obtivemos 467 correspondências.*

Resultados: *O diagnóstico psiquiátrico mais comum foi o abuso de drogas (34%), depois abuso de álcool (33%), perturbação de personalidade (24%) e perturbação aguda de* stress *(23%). Sessenta e dois por cento dos doentes tinham diagnóstico múltiplo, um subgrupo com seguimento hospitalar psiquiátrico mais longo, mais internamentos psiquiátricos e internamentos psiquiátricos mais longos. O achado mais interessante do nosso estudo foi a elevada prevalência de perturbações psicóticas: psicose orgânica (17%), esquizofrenia (15%), psicose sem outra especificação (14%) e perturbação esquizoafectiva (11%), que quando combinadas, em conjunto, estavam presentes em mais de metade (57%) dos nossos doentes sem-abrigo.*

Conclusões: *Os sem-abrigo com diagnóstico múltiplo têm mais necessidades em saúde mental e piores determinantes de saúde. Esforços para identificar e abordar este subgrupo de sem-abrigos com doença mental são necessários de modo a melhorar o seu tratamento e prognóstico.*

Palavras-chave: *sem-abrigo, doença mental, diagnóstico duplo, internamento, Portugal.*

CONTENTS

INTRODUCTION

The definition of homelessness has been long discussed and the different delimitation used by distinct authors is responsible for some of the heterogeneity between published articles studying this population. (Fazel et al., 2008; Hossain et al., 2020)

According to the European Typology of Homelessness and Housing Exclusion (ETHOS) there are 4 main categories of people that are included in the homeless definition: the roofless, the houseless, the ones with insecure housing, and the ones with inadequate housing (Table 1). (FEANTSA, 2005)

Table 1 Homeless definition adapted from ETHOS (FEANTSA, 2005).

Roofless
People living in the streets or public spaces.
People with no usual place of residence who use night shelters as emergency accommodation.

Houseless
People in short term accommodation for the homeless.
People in women's shelter due to experience of domestic violence.
People in short term accommodation for immigrants.
People due to be released from institutions with no housing available or identified.
People receiving long term accommodation due to homelessness.

Insecure Housing
People living temporarily with friends or family, with no legal tenancy or illegal occupation of land.
People living under threat of eviction.
People living under threat of violence.

Inadequate Housing
People living in temporary or non-conventional structures not intended as a place of usual residence.
People living in dwellings unfit for habitation.
People living in extreme over-crowding.

Note. ETHOS = European Typology of Homelessness and Housing Exclusion; FEANTSA = *Fédération Européenne d'Associations Nationales Travaillant avec les Sans-Abri.*

Homeless people are inevitably more vulnerable due to their living conditions, being the mortality in this group up to five times higher than the rest of the population. (Fazel et al., 2014) This high mortality is associated with a higher incidence of infections, heart disease, accidents, homicide, substance misuse and suicide, being drug overdose the leading cause of death among the homeless. (Baggett et al., 2013; Fazel et al., 2014; Ventriglio et al., 2015)

The substantial amount of psychiatric disorders in this population is well documented. (Fazel et al., 2008; Nielsen et al., 2011; Dunne et al., 2012; Edidin et al., 2012; Schreiter et al., 2017) According to a systematic review, the most prevalent mental disorder among the homeless, in western countries, is alcohol dependence (8.1% to 58.5%), seconded by drug dependence (4.5% to 54.2%) and psychotic disorders (2.8% to 42.3%). (Fazel et al., 2008) There is also high suicidal ideation in this population: Desai *et al* indicated that half of their sample, of 7224 homeless with mental illness, have attempted suicide. (Desai et al., 2003; Bauer et al., 2013)

Mental illness is an independent risk factor for homelessness; single adults with a major mental illness have a 25% to 50% risk of homelessness over their lifetime. (Folsom et al., 2005; Philippot et al., 2007; Shelton et al., 2009; Bauer et al., 2013) The burden of the mental health is preponderant among other known risks factors for becoming homeless, namely foster care experience and history of incarceration, and also among the known risks factors that reduce the chances of exiting homelessness, including psychotic disorders, and drug use problems. (Nilsson et al., 2019) The struggle of navigation in the mental health system, due to disorganization and severity of mental illness, also reduces the changes of homelessness escape. (Foster et al., 2012) Some studies report that most homeless first experience symptoms of mental disorders before their initial period of homelessness and that the ones who reported no symptoms were likely to develop them over time (Winkleby & White, 1992; Muñoz et al., 1998). The identification of specific patterns of homelessness in homeless people with mental illness led to the creation of different classifications. In 1979 Leach subdivided them into intrinsic, homeless due to mental or physical disability; and extrinsic, homeless due to situational factors. (Leach, 1979; Bhugra, 1996) In 1984, Arce & Vergare subdivided them into chronically homeless, predominantly older and mentally ill people; episodically homeless, younger people who alternate between housing and institutional care, and life on the streets; and transiently homeless, people without identified major mental illness that got homeless due to an acute situational crisis. (Arce & Vergare, 1984; Kuhn & Culhane, 1998; Fazel et al., 2014)

Within the marginalized group of the homeless mentally ill there is an even more vulnerable group, the homeless with dual diagnosis, that is, the homeless with a major psychiatric disorder plus a substance use disorder. Dual diagnosis people are overrepresented in the homeless population and are characterized by social isolation, including from support networks, having more difficulty accessing basic support like healthcare. (Fischer & Breakey, 1991; Schütz et al., 2019)

Generally, the contact of this population with the healthcare system is via the emergency department, using it more often and at higher rates than non-homeless people. (Salhi et al., 2018) The search for medical care often comes in cases of acute somatic crises, being the mentally ill among the homeless who use more health services. (Bonin et al., 2010; Kaduszkiewicz et al., 2017) Despite the great prevalence of mental disorders in this population, there is a paucity of motivation between the homeless to seek psychiatric treatment, and the ones who seek it often use the emergency department as their main source for psychiatric help, a place where there is no time and conditions to deal with the homeless' complex problems. (North, 1994; Kaduszkiewicz et al., 2017; Padgett, 2020) This disproportionate use of the emergency departments is an indicator of suboptimal utilization of primary care. (O'Neill et al., 2007; Bauer et al., 2013)

The homeless are more frequently hospitalized than the general population, for both medical and psychiatric reasons, and have a 45% increase in the length of psychiatric hospitalization stay, comparing to the non-homeless psychiatric inpatients. (Tulloch et al., 2012; Bauer et al., 2013)

This pattern of healthcare use, notably delayed presentations for medical attention, high emergency department reliance, high rates of hospitalization and extended length of hospital stays, and the overall poor health of the homeless leads to increased healthcare costs. (Salit et al., 1998; Bauer et al., 2013)

Examining Portugal's situation, there have been informal reports of mental illness afflicting the vagabonds of Lisboa, the capital and major city, for almost one hundred years. (Cebola, 1931)

More recently, in one night during 2009, in Portugal, 2133 people were identified as homeless (FEANTSA, 2017). In 2015, in Lisboa, there were 818 people sleeping rough (roofless) or in overnight shelters (houseless). (Rede Social de Lisboa, 2017) In 2013, the Portuguese homeless, in Lisboa, were mostly men (88.6%), mostly aged between 35 and 64 years old (68%) and only a few less than half (44%) had no Portuguese nationality. (Rede Social de Lisboa, 2017) Concerning the mental illness, a study of 2002, again in Lisboa, pointed to a worrying prevalence of 96% of psychiatric diagnoses among a sample of 1000 homeless people. (Cruz et al., 2002)

The simultaneous multiple problems that the homeless recurrently present and the categorization of them as off-limits or distracting makes their treatment perceived as demotivating among the health workers, the so-called difficult or even super-difficult patients. (Carnot & Gama Marques, 2018; Barreto et al., 2019; Padgett, 2020) A good example of the wicked problems psychiatrists have to deal with on a daily basis was published as a case report, by one of the authors, describing one particular super difficult patient, with 85 admissions in a twenty-five years span. (Marques, 2019)

Healthcare usage by homeless people remains a challenge worldwide, a truly wicked problem that led to the proposition, by some authors, that mentally ill homeless should become the object of Marontology, a new medical speciality, named after the Greek word *marontos*, which means unwanted. (Gama Marques & Bento, 2020b)

The study of the national homeless population is fundamental to the understanding of a phenomenon conditioned by the social picture of each country, providing the national social and health services a better source for policy implementation, allowing a more evidence-based approach targeting the wellbeing of the homeless. (Aldridge et al., 2018) Considering the lack of updated research concerning the mental health problems of the homeless population in Portugal, our main goal with the present study is to explore the demographic and clinical profile of the mentally ill living in Lisboa, Portugal, as homeless, in particular those living in primary homelessness (*i.e.*, roofless) and secondary homelessness (*i.e.*, houseless), according to the ETHOS. (FEANTSA, 2005)

METHODS

Study design, setting and participants

We used a cross-sectional design, collecting data during 4 years (from 01/01/2016 to 31/12/2019) among homeless people, in Lisboa, Portugal, that were referred to our psychiatric hospital team at *Centro Hospitalar Psiquiátrico de Lisboa* (CHPL) (https://www.arslvt.min-saude.pt/pages/283?poi_id=2228) as possibly mentally ill by the town hall social bureau workers at *Câmara Municipal de Lisboa* (CML). The contact with the homeless occurred mostly on the streets, with our psychiatric hospital team reaching them at their usual place for sleeping. However, some homeless people were reached during appointments or during an open therapeutic group for homeless, at CHPL, many times sent by other non-governmental organizations (NGO). To be eligible the homeless had to provide their full names and their date of birth, either to the town hall social bureau workers, or to the psychiatric hospital team, so that this data could be cross-checked with our CHPL hospital electronic database, looking for patient matches and the respective records. The electronic hospital archive had a twenty-year range (from 01/01/2000 to 31/12/2019), thus yielding a two decades retrospective search. Figure 1 represents the patient selection methodology.
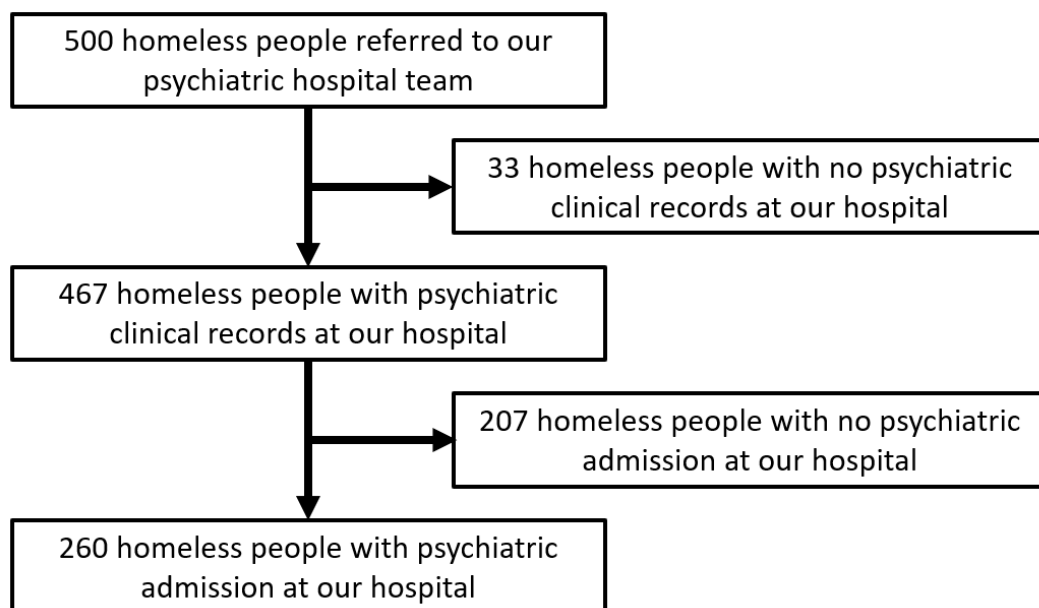

Figure 1 Flow diagram of the participants

Variables and Data Sources

This analysis explored clinical records from the CHPL database, a psychiatric hospital founded in 1942, previously known as *Hospital Júlio de Matos*, integrated in Portugal's publicly funded healthcare. These records included sociodemographic (sex, age, nationality, city of origin if Portuguese, usual place for sleeping), diagnostic, primary care registration (*Centro de Saúde*) and CHPL's hospital admission information.

The mental disorders diagnoses were made according to the tenth edition of the International Classification of Diseases (ICD 10) (World Health Organization, 2004) and we separated these diagnoses into primary and secondary for a better assessment of dual diagnosis, using the respective diagnostic codes.

What we called primary diagnosis included the main psychiatric diagnoses, with obvious hierarchy importance, as classically included in the Axis I of the fourth edition of the Diagnostic and Statistical Manual of mental disorders (DSM IV TR) (American Psychiatric Association, 2000). This includes diagnoses such as Other Mental Disorders Due to Known Physiological Condition (organic psychosis) (ICD 10 F06), Schizophrenia (ICD 10 F20), Schizoaffective Disorders (ICD 10 F25), Unspecified Psychosis Not Due to a Substance or Known Physiological Condition (ICD 10 F29), Bipolar Affective Disorder (ICD 10 F31), Recurrent Depressive Disorder (ICD 10 F33) and Acute Stress Reaction (ICD 10 F43).

The secondary diagnosis regarded comorbid psychiatric disorders, with less hierarchy importance, such as alcohol and drug abuse, usually essential for the dual diagnosis category, and/or the ones classically included in the DSM-IV-TR (American Psychiatric Association, 2000) second axis (mental retardation and personality disorders). Here we included Mental and Behavioural Disorders Due to use of Alcohol (ICD 10 F10), Mental and Behavioural Disorders Due to Multiple Drug Use and Use of Other Psychoactive Substances (ICD 10 F19), Unspecified Disorder of Adult Personality and Behaviour (ICD 10 F69) and Unspecified Mental Retardation (ICD 10 F79).

Whenever a patient had only a diagnosis included in the secondary diagnosis group it was considered as his/her primary diagnosis, e.g., if a patient had a single diagnosis of

ICD-10 Diagnosis Code F10, then alcoholism was considered his/her primary (and unique) diagnosis.

Our dependent variables were the number and duration of total psychiatric hospitalizations at CHPL, and the total years of follow-up at CHPL, based on the length of time between the first and last contact with CHPL.

Statistical Methods

The sample of this study was characterized by descriptive statistics including mean with standard deviation and median with interquartile range for continuous variables, and frequency with percentage for categorical variables.

We used a Welch's test, followed by a post-hoc Games-Howell's test, to test the hypothesis that there would be one or more mean differences in the length of follow-up between the different primary psychiatric diagnoses. Another Welch's test, followed by a post-hoc Games-Howell's test, was used to test the hypothesis that the higher the number of psychiatric diagnoses, the higher the years of follow-up. To test the hypothesis that multiple psychiatric diagnoses were associated with statistically significant longer lengths of follow-up, a non-parametric Mann-Whitney U tests was performed.

To test the hypothesis that the homeless with primary care registration had a higher number of psychiatric diagnoses, non-parametric Mann-Whitney U test was conducted. Another Mann-Whitney U test was executed to test the hypothesis that the Portuguese homeless had a higher number of psychiatric diagnoses.

Other two Welch's tests, followed by two post-hoc Games-Howell's tests, were used to test the hypotheses that there would be one or more mean differences in the number, as well as in the duration of psychiatric hospitalizations between the different primary psychiatric diagnoses. Finally, to test the hypothesis that multiple psychiatric diagnoses were associated with statistically significantly higher and longer psychiatric hospitalizations, a non-parametric Mann-Whitney U test was performed.

An alpha level of $p \leq 0.05$ was chosen to report significance for the estimated parameters.

IBM SPSS Statistics 26 (IBM Corp. Released 2019. IBM SPSS Statistics for Windows, Version 26.0. Armonk, NY: IBM Corp.) was used to conduct these analyses with professional supervision.

RESULTS

Of the 500 individuals living houseless or roofless, in Lisboa, Portugal, referred to our team, 467 (93%) had already a clinical record at our hospital. Thus, we excluded from further analysis the remaining 33 (7%) homeless without clinical records in our archive. Our sample of 467 homeless psychiatric patients was predominantly male (77%), with a mean age of 46.16 years (Standard Deviation, SD = 12.82). Mostly were Portuguese (59%), natural from Lisboa (68%).

Table 2 Sociodemographic characteristics of our sample of 467 homeless

Age Group	
18 to 35, n	106
36 to 50, n	193
51 to 65, n	141
65 to 75, n	21
>75, n	6
Sex	
Male, n (%)	358 (77)
Female, n (%)	109 (23)
Nationality	
Portuguese, n (%)	274 (59)
Refugees	
n (%)	66 (14)
Place for Sleeping	
Lisboa, n (%)	269 (58)

Note. n = number

The foreigners (41%) were from many different countries, as can be seen in Figure 2. The most represented foreign countries were Angola (17%), Iran (8%) and Guinea-Bissau (8%).
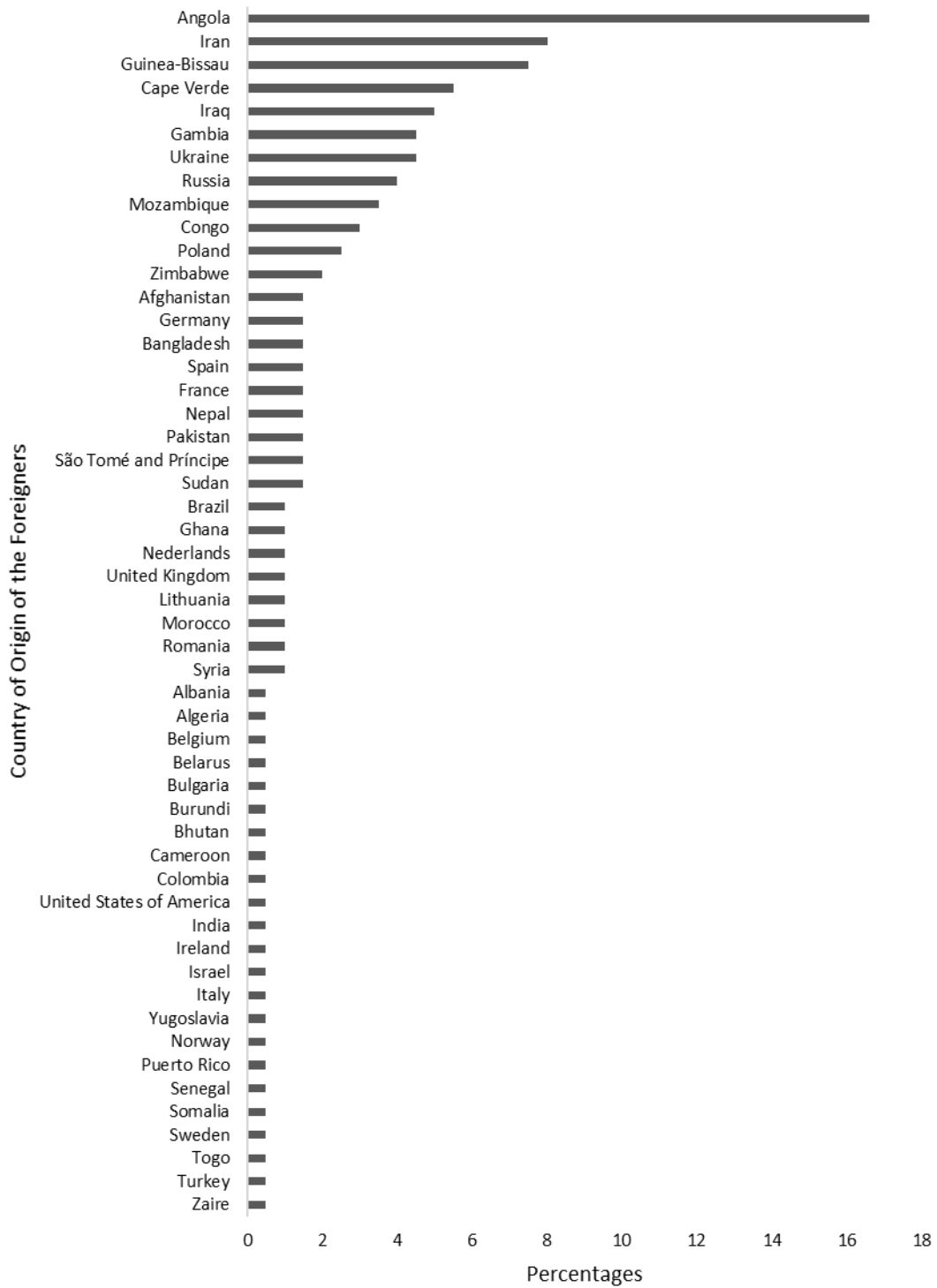

Figure 2 Country of Origin of the Foreigner Homeless

Lisboa was obviously the city of choice for sleeping (58%), but there were other Portuguese cities represented (Figure 3). The most significant places for sleeping rough, in Lisboa, were the parishes of Arroios (21%), Misericórdia (16%) and Santa Maria Maior (11%) (Figure 4, Figure 5).
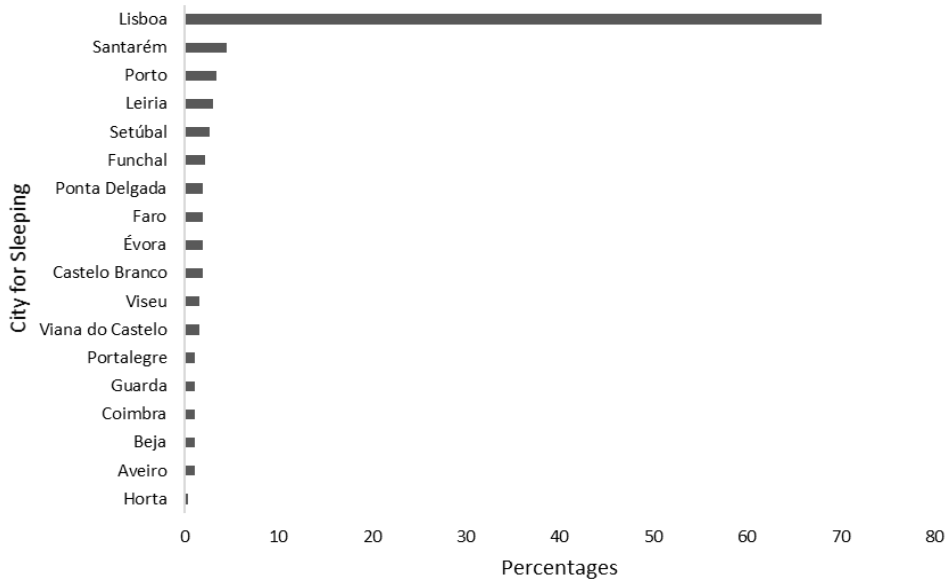

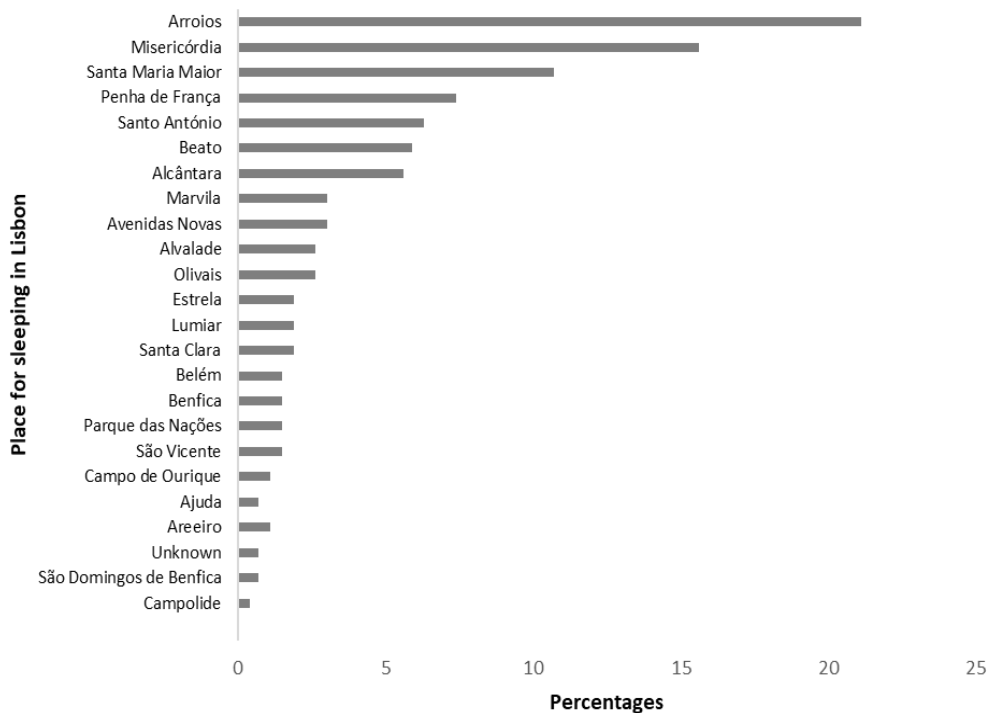**Figure 3 Homeless' Usual Cities for Sleeping**

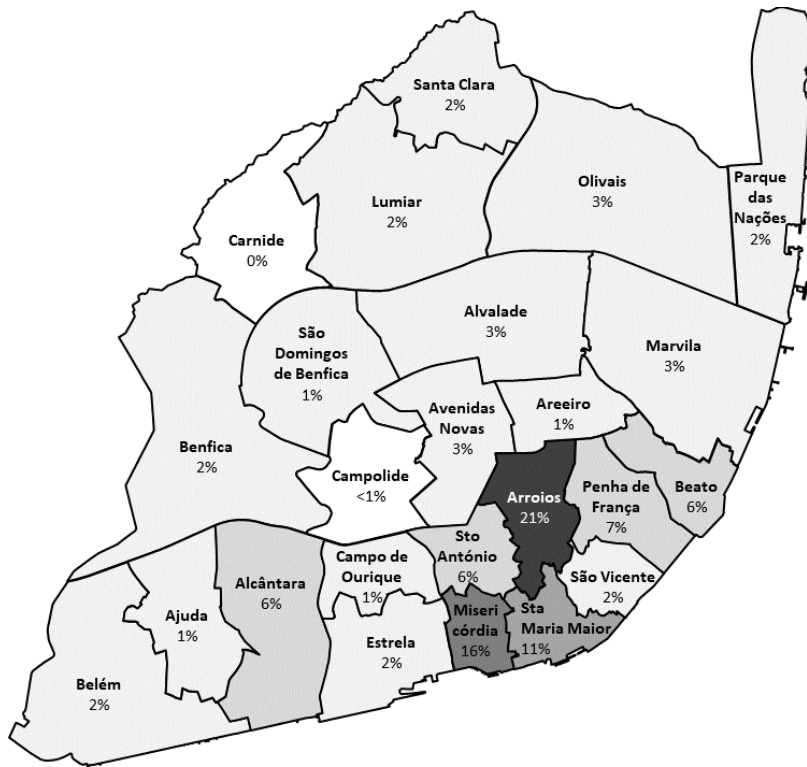**Figure 4 Homeless' Usual Place (Parish) for Sleeping Rough in Lisboa**

Figure 5 **Map of Homeless' Usual Place (Parish) for Sleeping Rough in Lisboa**

Somatic disorders were present in 159 homeless (34%). The most prevalent somatic diagnosis category was neurologic (18%), and among this the most prevalent diagnosis was dementia (64%). (Figure 6)
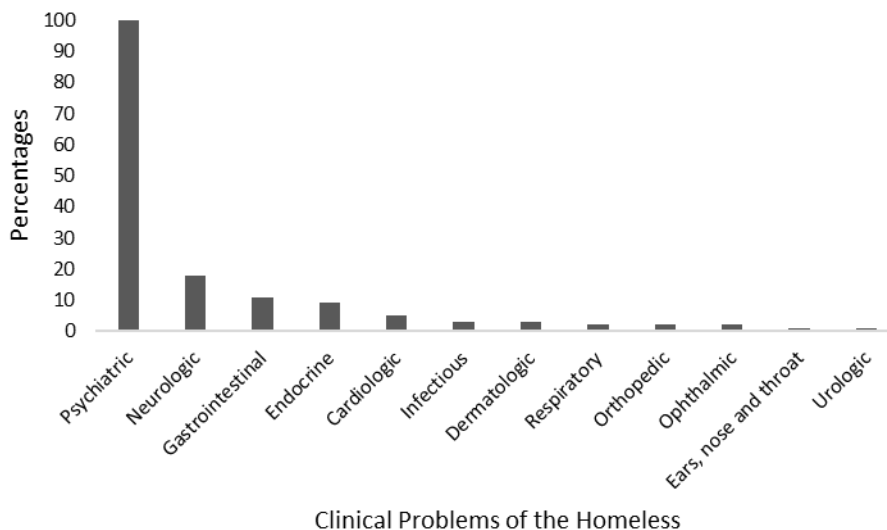

Clinical Problems of the Homeless

Figure 6 Prevalence of Clinical Problems in the Homeless

The percentage of the homeless registered in primary care (i.e., *Centro de Saúde*) was 63%, being 73% of them Portuguese (Table 4). There were some differences in the prevalence of psychiatric diagnosis between the homeless with and without primary care registration, as can be seen in Figure 7.
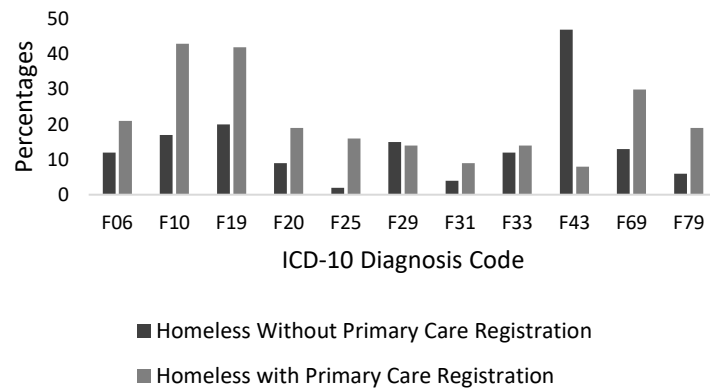

Figure 7 Prevalence of Psychiatric Diagnosis between Homeless with and without Primary Care Registration

The women (Median, *Mdn* = 5.50) and the Portuguese (*Mdn* = 8.00) had higher median years of follow-up (Table 4). A Welch's test demonstrated a statistically significant effect of the different psychiatric diagnoses in the length of follow-up, $F(6, 37.41) = 12.91$, $p < 0.001$. The Games-Howell's post-hoc analyses revealed that all the Diagnosis Code F25 post-hoc mean comparisons were statistically significant ($p < 0.001$) and that two of the Diagnosis Code F20 post-hoc mean comparisons were, as well, statistically significant ($p < 0.05$), namely the one with the Diagnosis Code F29 mean and the one with the Diagnosis Code F33 mean. That is, on average, the homeless with schizoaffective disorders have longer follow-ups than the other mentally ill homeless, and the homeless with schizophrenia have longer follow-ups than the homeless with unspecified psychosis and also longer follow-ups than the ones with recurrent depression. Another Welch's test showed a statistically significant effect of the number of psychiatric diagnoses in the length of follow-up, $F(4, 28.75) = 11.07$, $p < 0.001$. The post-hoc analyses failed to prove the hypothesis that the higher the number of psychiatric diagnoses, the higher the number of years of follow-up, even though the mean of years of follow-up of our sample follows the increase in the number of psychiatric diagnoses (Figure 8). A Mann-Whitney test revealed that the follow-up was

longer for the homeless with multiple diagnoses (*Mdn* = 7.00) than for the homeless with a single psychiatric diagnosis (*Mdn* = 1.00), *U* = 3795, *z* = - 4.52, *p* < 0.0001.
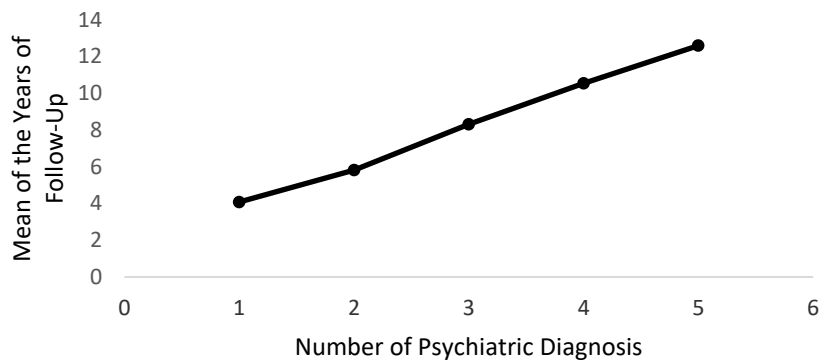

Figure 8 Relation between the Number of Psychiatric Diagnoses and the Years of Follow-Up

The most prevalent primary psychiatric disorder was acute stress reaction (ICD 10 F43) (23%), followed by mental disorders due to known physiological condition (ICD 10 F06) (17%), schizophrenia (ICD 10 F20) (15%) and unspecified psychosis (ICD 10 F29) (14%) (Table 3).

Table 3 Prevalence of Primary and Secondary Psychiatric Disorders in the Homeless

					ICD-10 Diagnosis Code					
F06	F10	F19	F20	F25	F29	F31	F33	F43	F69	F79
					% (95% *CI*)					
17 (13.7-20.8)	33 (28.7-37.5)	34 (30-38.3)	15 (11.6-18.4)	11 (8.4-13.9)	14 (10.9-17.6)	7 (4.9-9.2)	13 (10.1-16.1)	23 (18.8-26.8)	24 (19.7-27.6)	14 (11.3-17.8)

Note. *CI* = Confidence Interval

There were some differences in the psychiatric diagnoses' prevalence between Portuguese and foreigner homeless, as can be seen in Figure 9. Of the sixty-five houseless homeless refugees (14%), 80% had a primary diagnosis of acute stress reaction (ICD 10 F43).
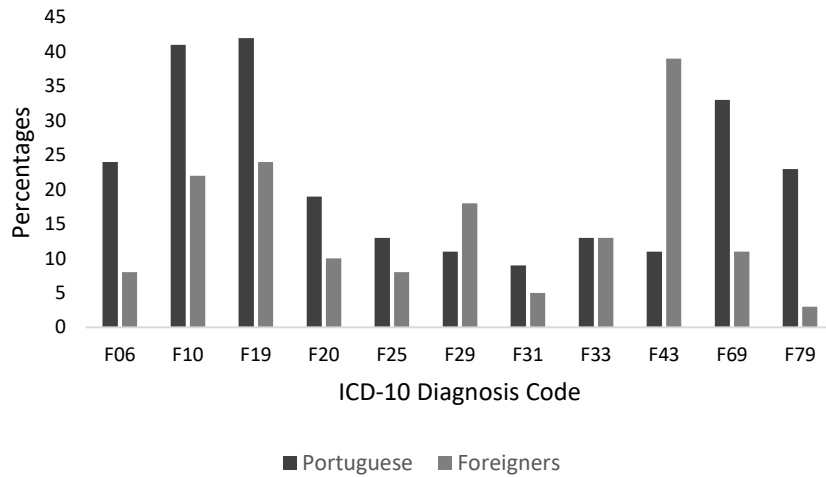
Figure 9 Prevalence of Primary and Secondary Psychiatric Disorders between the Portuguese and Foreigner Homeless

Sixty two percent (291) of our patients had multiple diagnoses (Figure 10). The most prevalent secondary psychiatric disorder was drug abuse (ICD 10 F19) (34%), seconded by alcohol abuse (ICD-10 F10) (33%), and personality disorder (ICD 10 F69) (24%) (Table 3). The most prevalent multiple diagnoses combinations were the ICD 10 Diagnosis Code F06 + F10 (6%), ICD 10 Diagnosis Code F29 + F19 (4%), ICD-10 Diagnosis Code F25 + F10 + F19 + F69 (4%) and ICD-10 Diagnosis Code F33 + F10 (4%).
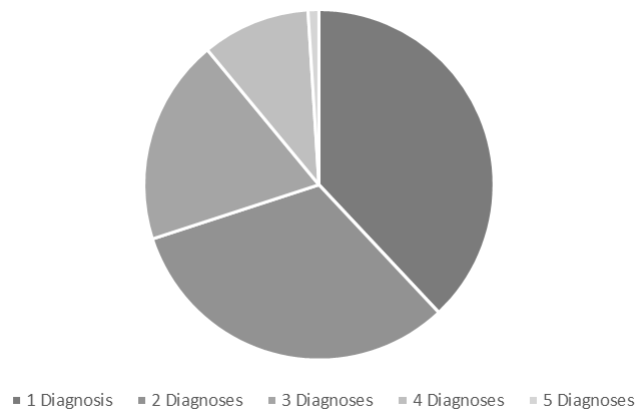

Figure 10 Prevalence of Number of Psychiatric Diagnoses

A Mann-Whitney test revealed that the number of diagnoses was higher for homeless with primary care registration (*Mdn* = 2.00) than for the homeless without a primary

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care registration (*Mdn* = 1.00), U = 14471, z = - 8.21, p < 0.0001. Another Mann-Whitney test showed that the number of diagnoses was higher for the Portuguese homeless (*Mdn* = 2.00) than for the foreign homeless (*Mdn* = 1.00), U = 14784, z = - 8.65, p < 0.0001.

Table 4 Sociodemographic characteristics of the homeless who use healthcare

Primary Care Registration	
Total Registrations, *n* (%)	293 (63)
Male, *n* (%)	226 (77)
Female, *n* (%)	67 (23)
Portuguese, *n* (%)	215 (73)
Refugees, *n* (%)	3 (1)
Years of Follow-Up	
Male, *Mdn (IQR)*	4.50 (1.0, 11.0)
Female, *Mdn (IQR)*	5.50 (1.0, 13.5)
Portuguese, *Mdn (IQR)*	8.00 (1.0, 12.0)
Foreigners, *Mdn (IQR)*	2.00 (1.0, 8.0)
Refugees, *Mdn (IQR)*	2.00 (1.3, 15.5)
Number of Psychiatric Hospitalizations	
Male, *Mdn (IQR)*	2.00 (1.0, 6.0)
Female, *Mdn (IQR)*	3.50 (1.0, 8.0)
Portuguese, *Mdn (IQR)*	3.00 (1.0, 7.0)
Foreigners, *Mdn (IQR)*	2.00 (1.0, 4.5)
Refugees, *Mdn (IQR)*	1.00 (1.0, 79.8)
Total Length of Psychiatric Hospitalizations (days)	
Male, *Mdn (IQR)*	55.00 (22.0, 138.0)
Female, *Mdn (IQR)*	53.50 (26.0, 160.0)
< 65 Years Old, *Mdn (IQR)*	57.00 (23.0, 143.0)
≥ 65 Years Old, *Mdn (IQR)*	44.50 (20.3, 125.8)
Portuguese, *Mdn (IQR)*	60.00 (23.0, 131.0)
Foreigners, *Mdn (IQR)*	48.00 (22.0, 188.5)
Refugees, *Mdn (IQR)*	24.00 (3.3, 315.5)

Note. Mdn = Median, *IQR* = Interquartile Range

Of the 467 homeless with records at our hospital, more than half (56%), 260, had been admitted at our psychiatric wards. The participants had a median of 2.0 (*IQR* 1.0, 6.8) psychiatric admissions and a median length of total psychiatric hospitalizations of 55.0 (*IQR* 23.0, 142.8) days.

Two Welch's tests demonstrated a statistically significant effect of the different primary psychiatric diagnoses in the number of hospitalizations, $F(6, 45.21) = 6.83$, $p < 0.001$ and in the duration of total psychiatric hospitalizations, $F(6, 59.09) = 10.35$, $p < 0.001$. A series of post-hoc analyses (Games-Howell) were performed to examine individual mean difference comparisons across the number and duration of psychiatric hospitalizations and all seven primary psychiatric diagnoses codes, as can be seen in Table 5.

A Mann-Whitney test showed that the number of the psychiatric hospitalizations was higher for the homeless with multiple diagnoses (*Mdn* = 3.00) than the homeless with a single diagnosis (*Mdn* = 1.00), $U = 3106$, $z = - 5.90$, $p < 0.0001$, and that the duration of the psychiatric hospitalizations was longer for the homeless with multiple diagnoses (*Mdn* = 71.00) than the homeless with a single diagnosis (*Mdn* = 34.00), $U = 3990$, $z = - 4.05$, $p < 0.0001$.

Table 5 Post-Hoc (Games-Howell) Mean Comparisons of the Number and of the Total Duration of Hospitalization between Different Primary Diagnosis

		Number of psychiatric hospitalizations		Duration of total psychiatric hospitalizations (days)	
		MD (I-J)	*p*	*MD* (I-J)	*p*
F06 (I)	F20 (J)	-.31	1.00	-27.79	1.00
	F25 (J)	-7.99	.10	-256.48	.08
	F29 (J)	2.31	.09	103.19*	<.01
	F31 (J)	0.44	1.00	50.14	.84
	F33 (J)	2.44*	.03	119.19*	<.001
	F43 (J)	2.90*	.04	132.75*	<.001
F20 (I)	F25 (J)	-7.67	.12	-228.69	.23
	F29 (J)	2.62*	.01	130.98	.07
	F31 (J)	0.75	.99	77.93	.76
	F33 (J)	2.75*	<.01	146.99*	.03
	F43 (J)	3.21*	.01	160.54*	.01
F25 (I)	F29 (J)	10.30*	.01	359.67*	<.01
	F31 (J)	8.42	.08	306.62*	.02
	F33 (J)	10.42*	<.01	375.67*	<.01
	F43 (J)	10.88*	<.01	389.23*	<.01
F29 (I)	F31 (J)	-1.87	.41	-53.05	.62
	F33 (J)	0.12	1.00	16.01	.84
	F43 (J)	0.59	.97	29.56	.26
F31 (I)	F33 (J)	2.00	.28	69.05	.28
	F43 (J)	2.46	.18	82.61	.13
F33 (I)	F43 (J)	.46	.98	13.56	.74

Note. * Statistically Significant Mean Difference (*MD*)

Table 6 Medians of Length of Follow-Up, of Number of Hospitalizations and of Duration of Total Hospitalizations, per Primary Psychiatric Diagnosis

	ICD-10 Diagnosis Code													
	F06		F20		F25		F29		F31		F33		F43	
	Mdn	*IQR*	*Mdn*	*IQR*	*Mdn*	*IQR*	*Mdn*	*IQR*	*Mdn*	*IQR*	*Mdn*	*IQR*	*Mdn*	*IQR*
Length of follow-up (years)	3.00	1.0, 11.0	7.00	1.0, 14.0	13.00	8.0, 18.0	1.00	1.0, 6.0	5.00	1.0, 8.5	1.50	1.0, 5.3	2.50	1.0, 7.0
Number of psychiatric hospitalizations	2.00	1.0, 5.0	3.00	1.0, 6.0	8.00	4.0, 11,0	1.00	1.0, 2.0	3.00	2.0, 5.0	1.00	1.0, 2.3	1.00	1.0, 2.5
Duration of total psychiatric hospitalizations (days)	66.00	24.5, 198.0	70.00	34.0, 143.0	131.00	74.0, 496.0	26.00	8.0, 48.0	51.00	28.5, 92.0	14.50	4.5, 49.8	13.00	2.8, 25.5

DISCUSSION

The sociodemographic features of our sample of mentally ill homeless were similar to the ones found in a study of 2013 that characterized Lisboa's homeless population. Nevertheless, our sample had a lower prevalence of males (77% vs 89%) and foreigners (41% versus 44%). (Rede Social de Lisboa, 2017) The foreign nationalities of the mentally ill homeless are not in tune with the most prevalent immigrants' nationalities in Portugal. The high prevalence of Angolan foreigner homeless, compared to other Portuguese speaking African countries, is misfit, since the Angolan compose only 3,8% of the Portuguese immigrant population, comparing with 7,2% of Cape-Verdean immigrants, the larger immigrant community from Portuguese speaking African countries. (Reis Oliveira & Gomes, 2019) In total, the Portuguese speaking African countries represent 35% of our foreigner homeless, below the 40% found in a previous study. (Rede Social de Lisboa, 2017) This high prevalence is related to the big migration movement from the Portuguese speaking African countries towards Portugal, mainly due to historical and cultural connections. Nonetheless, the 2013 homeless characterization contained 7% of Brazilian foreign homeless, and our sample only included 1%, despite the great prevalence of Brazilian immigrants (22% of the immigrants in Portugal). (Rede Social de Lisboa, 2017; Reis Oliveira & Gomes, 2019) This data suggests that the Portuguese speaking African countries immigrants' lower socioeconomic status, and race can have some influence on their outcomes, as suggested before, stigmatized groups are more likely to become homeless, in particular those with minority racial or ethnic status, being overrepresented among homeless people. (Laporte et al., 2018) As for the second most prevalent foreigner nationality in our sample, the Iranian, are mainly houseless refugees or political asylum candidates, living in temporary shelters, usually provided by other governmental institutions (*e.g. Conselho Português para os Refugiados* - CPR).

The most common psychiatric diagnosis in our sample of mentally ill homeless was drug abuse (34%), followed by alcohol abuse (33%), personality disorder (24%), and acute stress reaction (23%). The acute stress reaction diagnosis was more prevalent in foreigner homeless due to 80% diagnosis of acute stress reaction in the refugees, mostly post-traumatic stress disorder. This is in tune with the literature, as several

studies indicated alcohol and drug dependence as the most prevalent psychiatric disorders among the homeless. (Fazel et al., 2008; Fekadu et al., 2014; Yim et al., 2015; Schreiter et al., 2017) Despite these similarities, there is a lack of diagnoses classification uniformity between studies and little or no reference to organic psychiatric disorder, schizoaffective disorder, or post-traumatic stress disorder.

The diagnosis of organic psychosis (ICD10 Diagnosis Code F06) was higher in our sample (17%) than in previous studies, probably because we believe extreme caution is recommended when diagnosing severely psychotic patients, independently of their acute or chronic condition, as many different medical conditions are able to mimic functional psychosis such as schizophrenia, already nicknamed as the great imitated. (Gama Marques & Bento, 2020c; Marques, 2020) On the other hand, the higher prevalence of schizoaffective disorder (ICD10 Diagnosis Code F25) (11%) might be explained by our theoretical background that perceives schizophrenia, and related disorders, as a broad spectrum. (Gama Marques & Ouakinin, 2019)

The most striking finding in our study was the high prevalence of psychotic disorders: F06 organic psychosis (17%), F20 schizophrenia (15%), F29 psychosis not otherwise specified (14%) and F25 schizoaffective disorder (11%), that combined altogether were present in more than half (57%) of our homeless patients. These results are higher than a meta-analysis, conducted in 2019, that points to a prevalence of 29% of psychosis and 22% of schizophrenia in developing countries, and 19% of psychosis and 9% of schizophrenia in developed countries, among the homeless. (Ayano et al., 2019) Our psychiatric diagnosis prevalences may be tendentially higher due to our sample of mentally ill homeless, comparing to the broader sample of homeless people in most studies.

Sixty-two percent of our patients had multiple diagnoses, a close number to the described 55% prevalence of dual diagnoses, although previous studies usually conceptualize dual diagnosis as the combination of a primary psychiatric disorder plus alcohol or drug abuse. (Schütz et al., 2019) The number of diagnoses was higher for the Portuguese homeless and for the homeless with primary care registration, suggesting that closer contact and facilitated national healthcare engagement can promote

medical diagnosis. Multiple diagnoses patients had longer follow-ups, more psychiatric hospitalizations, and longer psychiatric hospitalizations than the homeless with a single diagnosis. These findings are accordingly to the evidence that homeless with dual diagnoses attend more primary healthcare services and emergency departments, have longer hospital stays, and have poorer psychological health. (Ding et al., 2011; Khan, 2017; Stenius-Ayoade et al., 2017)

Of the seven primary psychiatric diagnoses included in our sample, the homeless with schizoaffective disorder had statistically significant longer follow-ups, a higher median of psychiatric hospitalizations, and a higher median duration of total psychiatric hospitalizations. Despite these findings, the homeless with schizoaffective disorder did not have a coherent statistically significant difference in the number and duration of hospitalizations compared to the other primary psychiatric diagnosis. These findings differ from older ones by Russolillo *et al.*, who concluded that schizophrenia and bipolar disorder were the main predictors of hospital admission and length of stay. (Russolillo et al., 2016)

Limitations

This study's sample excluded the mentally ill homeless who had no contact with the workers of Lisboa's city hall bureau or with the CHPL psychiatric team, potentially excluding the John Does, such as homeless people with severe mental illness but without registered identity. These are indeed the super-difficult patients, in theory, the end-of-the-line of psychiatry care, and we acknowledge having failed to include them in our study. (Carnot & Gama Marques, 2018; Gama Marques & Bento, 2020a)

Despite the homeless 93% match in our hospital's database, we cannot assume that the excluded ones do not have mental illness, since the data obtained was limited to our psychiatric hospital records and these homeless can have medical files in other hospitals.

Primary care registration is not a reliable indicator of primary care attendance. We are all aware that for decades the "worried well" had easier access to mental health care than the "suffering sick". (Fuller Torrey, 1989)

The somatic diagnoses are probably underestimated due to the deficient registration of these conditions by psychiatrists in the patient's clinical electronic records.

When analysing the psychiatric hospitalizations determinants, we did not consider that the homeless with worse social support usually have longer hospitalizations due to difficulties in hospital discharge.

Future research

The greater challenges in the mentally ill homeless treatment are legislative, with lack of regulation regarding the homeless disabled by their mental disease who refuse treatment, and lack of coordination between health and social workers. (Bento & Barreto, 2002) Nonetheless, deciding to intervene whilst balancing patient autonomy and the principle of beneficence involves much skill and experience. (Yim et al., 2015)

We recommend the use of the most recent classification by World Health Organization, the ICD-11 classification, by further studies to improve research heterogeneity. (World Health Organization, 2018)

Future research is needed regarding the mentally ill homeless and their treatment, particularly the ones with multiple diagnoses, a subgroup with a high burden of mental illness, and worse determinants of health. It would be interesting to study the homeless with a primary psychiatric diagnosis plus an addiction disorder plus a personality disorder.

For better retrospective and prospective research, and better health care delivery, we recommend electronic medical record implementation at centres caring for homeless people. Research has demonstrated its suitability and effectiveness in the homeless population, allowing better care coordination, outreach, follow-up, and assessment of

outcomes. (Blewett et al., 1999; Health Care Home Program Clinicians' Network, 2002; Booth, 2006; Cavacuiti & Svoboda, 2008)

A follow-up of the patients that did not have a match at our hospital's database would be interesting for checking development of psychiatric diagnosis and treatment. In the future, we hope to perform a longitudinal study of follow-up with our full sample for better understanding of this phenomenon.

We are also interested in continuing previous studies regarding attachment disorder in the homeless population. (Stefanidis et al., 1992; Bento & Barreto, 2002; Taylor-Seehafer et al., 2008; Rodríguez-Pellejero & Núñez, 2018). Finally, in the future, we hope to be able to work with potential biomarkers candidates for homelessness, such as oxytocin, already proposed as having an interesting correlation with attachment styles. (Buchheim et al, 2009)

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