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Prevalence of psychiatric disorders among homeless people in Athens area: a cross-sectional study

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Abstract

Purpose   Homelessness is a chronic social phenomenon in European and other Western cities. In the recent years, the number of homeless people in Greece, mainly in Athens, is also increasing.

Method   The aim of this study was to explore the prevalence of psychiatric disorders among a sample of 254 homeless people, using the Mini International Neuropsychiatric Interview (M.I.N.I.). The sample was drawn from the existing shelters, soup kitchens, and the streets.

Results   The sample was predominantly male (74 %) with mean age 51 years, being in their majority homeless for over 25 months, 27 % of them living in the streets. The vast majority of the sample was single or separated with an education level <12 years. Current prevalence of psychiatric disorders was 56.7 % with 20.8 % comorbidity. For psychotic and mood disorders, current prevalence rates were 13 and 16 %, respectively. One year prevalence of alcohol and drug dependence was found to be low. Logistic regression analysis revealed that being older with higher number of months living in the streets and exposed to high frequency of adverse social events, increase the likelihood to become a psychiatric case. Finally, the vast majority of the identified psychiatric cases were lacking any current psychiatric care.

Conclusions   The magnitude of the prevalence of psychiatric morbidity was more than three times higher than that of the general population in Athens. Implications for psychosocial care and the organization of a support network for the homeless people are discussed.

Keywords   Psychiatric epidemiology · Prevalence · Mental disorders · Homelessness · Street people · Schizophrenia · Greece

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Introduction

Homelessness is a harsh human condition, mostly prevalent in urban areas of United States, Canada, Scandinavia, Great Britain, Australia, in several countries in Europe, and other geographical regions e.g., Asia, South America, and Africa. [1–18]. This condition is linked with a wide range of social, physical, and mental health problems and homeless people are often at risk of much higher psychiatric morbidity than that of the general population [1, 2]. Homelessness has also become an area of growing epidemiological research mostly in United States [1–4] and later in Western Europe [5–9]. Many studies have reported high prevalence of serious physical health morbidity such as tuberculosis and HIV and an increased mortality of three to four times higher than that of the general population [15–19].

Several investigators reported high prevalence of serious mental disorders among homeless people with at least tenfold variations in prevalence rates [20–22]. Psychotic disorders were reported to range from 2 to 31 %, depression from 4 to 41 %, anxiety disorders from 11.9 to 38 %, alcohol dependence from 8.5 to 58.1 %, drug abuse from 4.7 to 54.2 %, and personality disorders from 3 to 71 % [21]. This heterogeneity in epidemiological data findings is

probably a result of the sample selection, non standardized methods used, and definition of caseness [21, 22]. In fact, several studies were based on non-representative samples drawn from shelter or hostels populations [5, 8, 11, 15, 18]. Apart from exploring the dimensions of psychiatric morbidity among homeless individuals, a number of studies have revealed that those persons are showing certain sociodemographic characteristics as well as are underserved with ineffective psychosocial support systems and inadequate delivery of mental health care [23–28]. Particularly, homeless people in their majority are males, singles with less education living in urban centers, being members of minority groups, and living in extreme poverty [1, 29]. The majority of homeless mentally ill are not in contact with the mental health care system.

In recent years, Greece (population 10.6 million people) has witnessed a systematic economic crisis, and the general impression is that it has become psychosocial with increasing rates of mood disorders and suicides [30, 31]. As a result of this, a growing number of homeless people are to be noticed in the streets of the city of Athens and the port of Piraeus. The capital of Greece has a population of 850,000 (the municipality of Athens and the port of Piraeus), although the total inhabitants of greater Athens area are 4 million [32]. Estimates of homelessness by the European Federation of the National Organization Working with the Homeless (FEANTSA) increase the number of homeless people in 2006 to 7,800 for the whole Greece [33]. In this figure, homeless refugees were included. In 2009, a census carried out by an N.G.O. downtown Athens revealed 1,650 homeless individuals of Greek nationality [34]. Reliable data on the magnitude of dimensions of psychiatric disorders and related psychosocial problems among homeless people in Athens and Greece are non-existent with the exception of one study with a sample of 58 residents drawn only from only one shelter in Athens, conducted in 2002, with no use of any structured diagnostic instrument [35].

The aim of the present study was to provide data on the prevalence of specific psychiatric disorders among a sample of homeless individuals in Athens greater area, drawn from all the existing settings and other places these people used to live.

To our knowledge, this is the first study to date that has been carried out in Greece with the administration of a structured diagnostic interview and the selection of a representative sample.

Subjects and methods

Definition of homelessness

Based on FEANTSA criteria and those used by several other investigators [1, 7–9], the persons were defined as homeless if they met at least one of the two criteria: (1) The person who does not own a home and lives in a shelter or in a home of a relative or friend, temporarily, and has not rented a place in a conventional setting and (2) The persons who were living outdoors (rough sleeping places). The time criterion was put 30 days at least for the condition of homelessness.

Sampling

The criteria for inclusion in the sample were the following: Greek nationality, over 18 years of age, and meeting at least one of the previous described criteria. In order to avoid language problems, foreign born homeless mainly recent refugees from Asia (Afghanistan, Pakistan, and Bangladesh) or Africa (Algeria, Libya, Somalia) were not included. The refugees were males, young at age, living in rough sleeping places, fed on soup kitchens. The proportion of this population in the selected sample was <5 %.

Moreover, from the psychiatric epidemiology point of view, the refugees are a different area of research. A list of all existing social resources for homeless people in greater Athens area were compiled. In this list, four soup kitchen located down town of Athens and Piraeus, catering 1,550 portions of daily meals, two halfway houses in eastern and southern areas of Attica (70 beds), and three hostels (164 beds) placed in the city of Athens were compiled. In addition, there were also a Daycare/soup kitchen service in central Athens and a social support service in Piraeus, supporting exclusively homeless people. All these services were owned by local and religious authorities or some N.G.O.'s. The geographical distribution of these services was planned to cater the majority of homeless people in greater Athens area. Based on a recent census survey [34] on homelessness in the inner city of Athens, the aim was to collect data from approximately 15 % of the homelessness census population (1,560 persons). The subjects drawn from the shelters were 105 out of 156 reached members. A table of random numbers was used corresponding to the alphabetical subject list of each shelter tenants meeting the criteria to enter the survey. From the Social Support Services attended by 30 individuals during the interview period, 23 agreed to be interviewed. Finally, out of 228 persons receiving meals from soup kitchens 126 responded positively when they were selected randomly. The randomization procedure included the use of combined time/reason sample by selecting every second person who arrived at the soup kitchen place between the service hour schedules. It should be noted that 87 persons (34.3 %) were recruited from open places (rough sleeping places or abandoned buildings) for interview. The final sample comprised 254 individuals. The overall response rate reached 62 %.

Table 1 (A) Interrater reliability diagnostic study (N = 254)

Diagnosis	A Agreement (%)	Kappa	B Agreement (%)	Kappa
Cognitive impairment	100.0	1.00	–	–
Mood disorders	93.9	0.90*	92.8	0.89*
Psychotic disorders	100.0	1.00	75.0	0.70**
Anxiety disorders	72.7	0.69**	89.0	0.82**
Alcohol and Drug abuse (combined)	94.5	0.91*	35.0	0.30
Comorbidity	100.0	1.00	69.0	0.70**
No disorder	89.4	0.82*	–	–

(B) Validity of diagnosis by M.I.N.I. against psychiatrists diagnosis of those subjects sought treatment the last 6 months (N = 57)

* $P < 0.001$, ** $P < 0.05$

The comparison of sociodemographic characteristics of the persons who refused to be interviewed have shown a rather similar profile to those who participated in the study. Those who did not agreed to participate were also predominantly males of middle age, single or separated, and chronically unemployed.

Instruments

The interview was structured and consisted from two parts. The first part contained demographic data (gender, age, place of birth, marital status, education level, work history, previous occupation, history of homelessness), information regarding the condition of homelessness (living spaces, arrangements e.g., staying in a shelter or in rough sleeping places). Issues of personal hygiene, safety, problems with the law, the presence of physical or mental illness, utilization of health services, inpatient admissions, and taking of medication were also recorded.

The second part included the Mini International Neuropsychiatric Interview (version 5.0.0) [36]. This schedule has been translated and tested in terms of its applicability in the Greek language [37]. It includes closed questions (yes/no format) measuring 17 disorders according to Diagnostic and Statistical Manual (DSM-IV) diagnostic criteria.

M.I.N.I. has been chosen because it requires shorter duration of the psychiatric interview (approximately 20 min) than other structured diagnostic schedules, and it allows administration by non psychiatrists. Prevalence was recorded according to M.I.N.I. structure and in the present study, it was focused on current psychopathology. In one subject in which cognitive impairment was apparent, the Mini Mental State Examination schedule (Greek version) was administered [38]. Comorbidity cases were detected when more than one diagnosis was detected for each subject.

Table 2 Adverse social conditions experienced the last 12 months (N = 254)

The Index of Social Distress	Males N = 188	Females N = 66	Total N = 254	χ^2 Yates corr.	Sign.
1. Being mugged (N = 254)	60.3	66.7	61.6	1.78	NS
2. Being assaulted violently (N = 254)	58.6	66.7	59.0	0.003	NS
3. Arrested (N = 254)	29.8	6.1	23.6	15.24	<0.01
4. Sentenced by the court (N = 254)	34.6	9.1	74.0	15.75	<0.01
5. Jailed the last year (N = 254)	24.5	7.6	20.0	8.69	<0.01

Reliability study

A specific interrater reliability and validity study was carried out including all 254 interviews. Agreement (%) on diagnoses and kappa coefficients [39] ranged between 100.0 and 72.7 % and from 1.0 to 0.69, respectively, showing that M.I.N.I. is a reliable instrument (Table 1).

Validity study

The validity study included the exploration of concordance between the current study diagnosis by the application of M.I.N.I. and with that given by a psychiatrist when the subject had a recent outpatients or inpatient treatment. Clinical information was made possible for only 57 persons. Kappa coefficient was found to range from 0.89 to 0.70 for the diagnosis of mood and psychotic disorders (Table 1).

Index of Social Distress

Based on previous literature [40–44] and the nature of living conditions of homeless, an Index of Social Distress (I.S.D.) was formulated consisting of five stressful conditions the homeless people had experienced the last 12 months. Table 2 presents five categories of adverse social conditions the homeless people have probably been exposed during the last 12 months prior to the interview.

The vast majority of both males and females reported that they have been victims of mugging or violent assaults. A substantial proportion of males have been arrested by the police as well as they have been sentenced by a court or jailed.

Procedure

Interviews were personal with duration of approximately 60 min, conducted by only one interviewer, the second of the authors, being a postgraduate professional in mental health and Registered Psychiatric Nurse. For each interview, specific protocol was kept. After the selection of each subject, the nature of the study was explained and consent has been obtained. Interviews were carried out between January 2010 and March 2011. The total duration of the interviews was 152 weekdays. In order to test any possible seasonal impact on the selection of sampling, we divided the finalized interviews into those which had been carried out during winter/spring months and to those of summer/autumn. The comparison of sociodemographic characteristics did not show any differences.

Statistical analysis

The data in this study are presented as percentage values. Dichotomous variables were compared using Chi square tests, with Yates correction due to the fact that the value of the cells were <5. Logistic regression analysis with backward selection procedure was used to explore odds ratios for the association of some demographic or factors related to homeless or self-reporting psychiatric problems with psychiatric caseness established by M.I.N.I. The variables were chosen on the basis of their clinical interest.

The I.S.D. entered in the analysis a numerical variable derived from the total of no (1) or yes (2). The total score is ranging from 5 to 10. The following variables were included in the analysis with the respective reference groups listed in parenthesis: age, gender (female), marital status (single), employment (the last 12 months), duration in months as homeless (none), I.S.D., self-reported psychiatric problem (none), self-reported drug, or alcohol abuse problem (none). The final model included odds ratios and 95 % confidence intervals. Data were analyzed using S.P.S.S. version 15.0 software package.

Results

The average age of males and females were 50.91 (±12.2) and 51.98 (±14.52), respectively. The vast majority of the samples (187) were males (74.0 %), a proportion very similar to that reported in 2009 census of homeless people in Athens area (Table 3).

Most of the sample were single (106, 41.7 %) or divorced (107, 42.1 %) with education years ≤12 years. Only 52 individuals (20 %) were employed the last 6 months and 30 (11.8 %) were recipients of a welfare benefit. With respect to their previous occupation, 63

persons (28.7 %) and 73 individuals (28.7 %) were skilled or unskilled workers and clerks, respectively. Only 4.4 % reported that they had not any previous occupation. Almost the same proportions of homeless people were found in the 2009 census, in each of the above demographic categories. As far as the place of actual living is concern, the majority of the sample in this study and the census of homeless

Table 3 Sociodemographic characteristics of homeless in Athens area (N = 254)

	The sample (%)	2009 census of homeless (%)	2001 census of general population (%)
Proportion male	74.0	70.0	46.0
Age (mean)	51.0 (±12.7)	48.1 (±13.9)	37.8 (±20.6)
Marital status			
Single	41.7	50.3	23.0
Separated	42.1	38.3	3.0
Married	7.9	3.8	71.3
Widowed	8.3	7.6	2.7
Education in years			
≤6	45.7	42.6	89.0 (0–12)
6–12	43.7	46.5	
≥13	10.6	10.9	11.0
Employed (the last 6 months)	20.0	15.0	85.0
On welfare benefit	11.8	9.1	–
Previous occupation			
Owners of small business	13.4	8.1	19.5
Clerks	24.8	20.3	4.3
Skilled workers	28.7	24.0	29.0
Unskilled workers	28.7	38.7	15.2
None	4.4	8.9	
Place of actual living			
Guest	4.7	9.9	
Abandoned buildings	8.3	11.1	
Outdoor	26.0	24.6	
Shelters/hostels	58.2	50.4	
Other	2.8	4.0	
Time spent in homelessness (months)			
≤6	18.5	21.6	
7–12	15.5	19.1	
13–24	16.0	15.8	
≥25	50.0	43.5	

people in 2009, were living in shelters. One fourth of both categories reported the place of sleeping to be streets or abandoned places. Half of the sample reported that they were homeless for more than 25 months. More than half (134 persons) of the sample (53.0 %) reported that their family knew their situation although 198 subjects (78.5 %) mentioned that their family members had no intention of helping them.

The prevalence of psychiatric caseness is shown in Table 4. The administration of M.I.N.I. revealed that 55.8 % of homeless males and 59.1 % of females have been characterized as psychiatric cases suffering from any DSM-IV nosological entity.

The total DSM-IV psychiatric morbidity was 56.7 %. Out of 144 diagnosed cases, 24.8 % of males and 11.8 % of females had a dual diagnosis, a statistically significant difference. A total of 20.8 % psychiatric comorbidity was found, 24.8 % among males and 11.8 % among females.

Significant proportions of the sample were diagnosed as suffering from mood disorders (16.1 %), psychotic disorders (13.0 %), and anxiety disorders (11.8 %). In all the above diagnostic categories, females showed higher rates than their male counterparts. The gender differences in the prevalence rates of psychotic disorders were statistically significant. Surprisingly, they were only males diagnosed as alcohol dependent. The rates for PTSD and both alcohol and drug dependence/abuse were found to be low, given the fact of the harsh homelessness condition.

In the last, Table 5 shows the logistic regression results. Being older with higher number of months spent in homelessness, increased the likelihood to be a psychiatric case. The experience of social distress conditions was found to increase 4.8 times the probability to suffer from a psychiatric disorder. Finally, persons who self reported a mental health problem or drug/alcohol abuse were more likely to be diagnosed as a psychiatric case.

Utilization of mental health services by those homeless people who were currently identified as psychiatric cases was poor. Out of 144 clinical cases, only 52 (36.2 %) were in contact (and treatment) with a psychiatrist and 29 (20.1 %) have been hospitalized the last year in a psychiatric setting. Moreover, only 32 (22.3 %) out of 144 subjects were receiving any psychotropic medication. Further analysis of the help-seeking and treatment patterns of the sample will follow.

Discussion

The exploration of extend of psychiatric morbidity and related psychosocial problems among the homeless people in the metropolitan area of Athens revealed an overall current prevalence of mental disorders exceeding 50 % of

Table 4 Prevalence of psychiatric disorders among homeless in Athens area (data expressed as percentage values) (N = 254)

Diagnosis (DSM-IV)	Time[a] prevalence	Males N = 188 %	Females N = 66 %	Total N = 254 %
Mood Disorders		15.4	18.1	16.1
Major depressive episode	Last 2 weeks	10.1	13.6	11.1
Dysthymic disorder	Last 2 years	3.7	4.5	3.9
Bipolar disorder	Current	1.6	–	1.2
Anxiety disorders		11.2	13.6	11.8
Obsessive Compulsive disorder	Last 6 months	0.5	1.5	0.8
Post traumatic stress disorder	Last month	2.1	1.5	1.9
Generalized stress disorder	Last month	8.5	10.6	9.0
Psychotic disorder	Current	10.6	19.7	13.0*
Alcohol dependence/ abuse	Last 12 months	7.4	–	5.5
Drug dependence/ abuse	Last 2 months	8.0	1.5	6.3
Antisocial disorder	Lifetime	2.2	–	1.5
Cognitive impairment[b]	Current	0.5		0.5
Suicidality	Last month	0.5	1.5	1.9*
Any DSM-IV disorder		55.8	59.0	56.7
Any dual DSM-IV disorder[c]		24.8	11.8	20.8**

Chi square with Yates correction

[a] Based on M.I.N.I. time prevalence criteria

[b] Based on Mini Mental State Examination

[c] Based on the 144 identified diagnosed psychiatric cases

* P < 0.05, ** P < 0.01

the sample. Higher prevalence rates for psychotic and mood disorders were observed compared to those detected in the general population [9, 47, 53]. In the Athenian study, several other unfavorable findings confirmed that this group of people is extremely vulnerable and underserved population, a common finding in other studies [2–18].

Methodological issues

Representativeness is an issue concerning the structure of the sample. The comparison of sociodemographic data of this sample to those of the 2009 homeless population census revealed similarities in both the profiles of homeless populations. As it was expected, great discrepancies between the homeless populations (our sample and the

Table 5 Logistic regression results: dependent variable: psychiatric caseness/non caseness (N = 254)

Variables	O.R.	95 % CL	df	Wald statistic	Sign.
Gender	0.60	0.3–1.22	1	2.00	NS
Age (in years)	0.97	0.9–1.00	1	3.61	P < 0.05
Marital status	0.60	0.4–1.1	1	2.18	NS
Employed the last 6 months	0.34	0.1–1.2	1	2.84	NS
Duration as homeless (in months)	1.01	0.1–1.2	1	5.87	P < 0.02
Index of Social Distress (score)	4.82	2.3–10.0	1	4.86	P < 0.05
Psychiatric problem (self-reported)	7.54	3.7–15.0	1	32.80	P < 0.0001
Alcohol abuse (self-reported)	17.41	4.6–65.7	1	17.75	P < 0.0001
Drug abuse (self-reported)	3.36	0.9–11.4	1	3.75	P < 0.05

census one) and those of the general population of Athens greater area are observed. An effort to secure the representativeness of the sample was made by the inclusion of all the existing various types of resources scattered in different geographical locations in two main urban areas (Athens and Piraeus) where the vast majority of homeless people could be reached. This approach was kept to avoid the risk of overrepresentation of participants using only one type of service, e.g., shelters. A proportion of 34.3 % of persons were also recruited from rough sleeping places. Several investigators also reported similar sampling procedure [5, 9, 20]. Regarding the response rate 62 %, this could be attributed to the nature of this population and the fact that no financial incentives were given, a common practice by others [5, 7, 9, 18]. However, similar response rates ranging from 52, 64.2 to 65 % were reported [1, 2, 8, 20], although others stated higher rates [5–7, 9].

The reliability and validity tests of M.I.N.I. used in this population provided kappas coefficients statistical significant in basic nosological entities. It seems that this tool is reliable and valid to reassure any diagnostic category was designed to identify. In addition, the carrying out of interviews by one interviewer could avoid the "between interviewers" variability in the selection of the sample and the diagnostication.

Demographic and social characteristics

The mean age of the sample was 51.2 years with half of the sample being in the streets for more than 24 months. It becomes evident that the Athenian homeless sample were of middle age with many years without a home and does

not constitute cases of episodic loss of housing, a common phenomenon in periods of economic crisis [30]. Older homeless people were also found to be predominant in Madrid and other European countries, while younger samples were reported in USA, Canada, Australia, and Brazil [1, 5–10, 13, 14, 16, 18, 42–44].

The major cause of house loss was serious financial problems (40.5 %) or family disruption (20.6 %). Only 12.1 % of the sample reported that health problems had caused homelessness. In the samples of almost all studies, the majority of the homeless were males. In our study, men constitute 74 % of the sample [1, 7–9, 21, 22]. Apparently, the Greek women vulnerable to homelessness are probably "protected" from living on the streets by their family or relatives [45]. Similarly, the same explanation might exist for other southern European societies [7].

The educational levels found in this study are compatible to those reported by others [5, 7, 20]. Our sample in higher proportion comprises graduates from high school, a finding confirmed only by few investigators [10, 20].

Regarding the place of spending the night, several investigators provided similar data [6, 8, 23, 42]. A significant percentage of homeless people live in the streets or in rough sleeping places. In our sample, 87 persons (34.3 %) were sleeping in the streets or in abandoned places. The profile of marital status (mostly single or divorced) of our sample presents similar characteristics with that reported by other investigators [5, 6, 8, 9, 25, 28]. The same holds true for the employment status [5–9, 25, 42, 43].

The prevalence of psychopathology

The use of M.I.N.I. provided current overall prevalence rates reaching 56.7 % with females showing slightly higher rates (59.0 %). The corresponding rates in similar studies carried out in Munich, Madrid, and Paris were 48, 73, and 29.1 %, respectively [5, 6, 8, 9]. Wittchen et al. [46] in their review of prevalence studies in non clinical general population in 30 European countries found an average of current prevalence of 38.2 %. Similarly, high rates of psychopathology were reported in several studies with homeless people in other geopolitical regions, e.g., Australia, Canada, Brazil, and S. Korea [10–16, 18].

In Greece and particularly in Athens area, overall prevalence rates in the general population were found to range for 14.5 % in 1981, 18 % in 1985 and 15 % in the whole country in 2010 [47–49]. In our study, the current prevalence of psychotic disorders among the homeless was found 13 %, when in Madrid, Paris, and Munich (metropolitan areas comparable to Athens area), the corresponding rates were lower [5, 6, 8, 9].

It is not clear if this finding is attributed to a massive deinstitutionalization project the last 15 years in Greece

[50, 51]. However, it is known that deinstitutionalization of 3,000 long stay inpatients mainly suffering from chronic schizophrenia was focused on their community alternative placements. The patients with chronic schizophrenia and without any social support system who were living in the community were not included in the project [50, 51]. In the category of mood disorders, we reported that 16 % of homeless people were diagnosed accordingly. Higher rates of depressive disorders were also found in surveys with homeless populations [5, 6, 8].

In Greece, a recent study revealed that 6.8 % of the general population samples were suffering from major depressive episodes [30]. Previous studies have shown even lower rates [52]. In the Wittchen et al. [46] review, major depression was estimated in an average of 6.9 % among studies conducted in 30 countries. Females in our sample and all the other homelessness studies were found to suffer from depression in greater extend. The current prevalence of anxiety disorders (including P.T.S.D.) in this study was 11.8 %, a similar rate to that reported from the Munich study [9]. Mavreas and Scapinakis [53] found a prevalence rate of 10.8 % in their general population study in Greece nationwide. In our study in the area of dependence of substances in both categories of alcohol and drug abuse/dependence, the current prevalence rates were 5.5 and 6.3 %, respectively, far lower than those reported by others in Madrid, Munich, and Paris [5, 6]. The rates of alcohol and drug dependence in the Parisian study were 14.9 and 10.3 %, respectively. In the Madrid study, alcohol and drug dependence reached 26 and 10 %, respectively. Several investigators in USA, Canada Australia, and Brazil reported current prevalence rates even exceeding 50 % [2, 4, 10, 16, 18]. Fazel et al. [22] in their review of ten surveys with homeless people found an average prevalence of drug dependence of 24.4 % (4.7–54.2 %). Epidemiological studies in the community on alcohol and drug dependence in Athens, estimate the extend of these two nosological entities up to 10.0 and 8.6 %, respectively [54, 55]. A possible explanation of the low rates of substance abuse in our sample is that 58.2 % of the sample was drawn from shelters where the use of licit or illicit drugs is prohibited. Among the 87 people who were living in the streets, the prevalence of substance use was two times higher than the average rates. Another issue is that homeless drug dependent people are hesitant to seek a refuge with the exception when there are very bad weather conditions, a rather rare climatic phenomenon in Athens.

The current prevalence rates of dual diagnosis (comorbidity) were 20.8 % much lower than those reported by others [5, 9, 20, 26] with comorbidity rates ranging from 67 to 70 %. A possible explanation of the low comorbidity rates in this study is the finding of the low rates of alcohol and drug dependence, given the clinical fact that these two entities co-exist with psychotic or mood disorders in most of the comorbid cases of homeless people [22].

Suicidal behavior (suicidal attempts) among the homeless of this study reached 1.9 %, while in the recent studies by Madianos et al. [30] and Economou et al. [31], these rates were 5.2 % in the general population of Greece.

The exploration of the risk factors for becoming a "psychiatric case" among the homeless people in Athens greater area revealed that age (being older) having spent more time in the streets and being exposed to higher number of adverse social conditions or events as well as the poorer self assessed mental health (self-perceived psychiatric disorder) increased the likelihood of being a diagnosable psychiatric case. It seems that the time-duration factor (being older and longer living roofless) increased the probability of exposure to stressful life events, which are closely related to the genesis of psychopathology [41–44]. On the other hand, the dimensions of self-assessment of health as a predictor of psychopathology have been noticed by others [56].

Help seeking

Preliminary analysis revealed that half of the homeless people who were identified as suffering from a specific DSM-IV disorder were lacking any contact with psychiatric service of a psychosocial resource.

This underutilization of mental health services is common among individuals facing homelessness [8, 23, 28]. The alcohol or drug addicts had the highest access to care probably due to the program of "streetwork" by an N.G.O. In general, homeless people are a neglected minority by medicine and especially, by psychiatry. However, a recent community study with general population sample in Athens area has shown that there is a gap between the onset of psychopathological symptoms and the time of help-seeking [57].

Limitations

A number of limitations have already been mentioned: the response rate of 62 % and the representativeness of the sample. The geographical dispersion of the sampling locations in all existing resources including 34.3 % of the sample drawn from rough sleeping places indicates a degree of representativeness of the subjects. The response rate could have been increased by financial incentives, a technique followed by other investigators [5, 9, 20]. Life prevalence rates of psychopathology were not provided. It should be noted that in the majority of subjects when additional questions on psychopathological symptoms covering their lifetime were asked, they provided

contradictory answers in clinical terms, e.g., reported a mental hospital admission the past 5 years, but denying the existence of mental illness at that time. A similar problem on detection of information on childhood events was also observed. Another limitation was the lack of age matched community controls. This could produce a much larger sampling, not feasible under the financial circumstances of the study.

It is of note that the hypothesis on mental illness causing homelessness remains unanswered due to the cross-sectional design of the study. Nevertheless, the finding that only 12.1 % of the sample population confirmed that the problems from physical and mental illness were the reason for homelessness might explain the role of illness in the genesis of the above phenomenon. Apparently, the status of homelessness is a complex problem of causation. Economic factors (unemployment, financial downturn), family disruptions (divorce or separation, abandonment), public health, and social policy issues (deinstitutionalization, lack of sufficient places for accommodation) should be considered on the possible causation issues [7].

Conclusions

One major finding of this study is that the current prevalence of severe mental disorders among the homeless people of greater Athens area was also high in comparison to other studies of similar design. From another point of sociocultural view, we would expect Greek homeless to be different in their demographic characteristics from other countries. In fact, differences in the mean age of Athenian homeless reflect cultural differences between several countries such as USA, Canada, and Brazil. Our findings (older homeless, few females) are closely comparable with that of Spain, meaning that southern families may serve as a protective buffer that keeps younger people and females from becoming homeless. Nevertheless, this is a population at greater risk for becoming mentally ill from any other population group, with probable exception of the refugees.

Second finding, was that homelessness is predominantly a male phenomenon. The female is probably still protected by the family system. The chronicity of homelessness in the years prior to 2010 (that is when the serious economic recession phenomena occurred) cannot be attributed to the crisis. However, in the near future, it is important to examine the impact of this harsh economic condition on the dimensions of the problem of homeless people and the prevalence of psychiatric disorders. The high psychiatric morbidity and the low rates of mental health service utilization pose the question of whether the community mental health care system will reach high risk groups such

as homeless people or the system will continue to neglect them. It is also expected that the continuing deepening of socioeconomic crisis in Greece will produce a new generation of homeless people and therefore, there must be an alert in the reorganization of a psychosocial care system to reach and support this vulnerable population.

Conflict of interest   None.

References

1. Link B, Susser E, Stueve A, Phelan J, Moore R, Struening E (1991) Lifetime and five-year prevalence of homelessness in the United States. Am J Public Health 84:1904–1911
2. Bassuk EL, Rubin L, Lauriat A (1984) Is homelessness a mental health problem? Am J Psychiatry 141:1546–1550
3. Lamb HR (1984) Deinstitutionalization and the homeless mentally ill. Hosp Community Psychiatry 35:899–907
4. Susser E, Struening EL, Conovers S (1989) Psychiatric problems in homeless men: lifetime psychosis, substance use and current distress in new arrivals at New York City shelters. Arch Gen Psychiatry 46:845–850
5. Fichter MM, Koniarczyk M, Greifenhagen A, Koegel P, Guadflieg N, Wittchen HU, Wolk J (1996) Mental illness in a representative sample of homeless men in Munich, Germany. Eur Arch Psych Clin Neurosci 246(4):185–196
6. Vazquez C, Munoz M, Sanz J (1997) Lifetime and 12-month prevalence of DSM-III-R mental disorders among the homeless in Madrid: a European study using CIDI. Acta Psychiatr Scand 95:523–530
7. Munoz M, Vazquez C, Koegel P, Sanz J, Burnam MA (1998) Differential patterns of mental disorders among the homeless in Madrid (Spain) and Los Angeles (USA). Soc Psychiatry Psychiatr Epidemiol 33:514–520
8. Kovess V, Lazarus M (1999) The prevalence of psychiatric disorders and use of care by homeless people in Paris. Soc Psychiatry Psychiatr Epidemiol 34:580–587
9. Fichter MM, Quadflieg N (2001) Prevalence of mental illness in homeless men in Munich, Germany: results from a representative sample. Acta Psychiat Scand 103:94–104
10. Herrman H (1990) A survey of homeless mentally ill people in Melbourn. Australia Hosp Community Psychiatry 41:1291–1292
11. Morikawa S, Uehara R, Okuda K, Shimizu H, Nakamura Y (2001) Prevalence of psychiatric disorders among homeless people in one area of Tokyo. Nihon Koshu Eisei Zasshi 58:331–339
12. Hans OS, Lee HB, Ahn JH, Park JI, Cho MJ (2003) Lifetime and current prevalence of mental disorders among homeless men in Korea. J Nerv Ment Dis 54:272–275
13. Heckert U, Andrade MJM, Alves M, Martins C (1999) Lifetime prevalence of mental disorders among homeless people in a southern city of Brazil. Eur Arch Psychiatry Clin Neurosci 249:150–155

14. Herrman H, Mc Gorry P, Bennett P, Riel R, van Mc Kenzie D, Singh B (2004) Prevalence of severe mental disorders in a dis-affiliated and homeless people in inner Merbourne. Am J Psy-chiatry 146:1179–1184

15. Hwang SW (2000) Mortality among men using homeless shelters in Toronto, Ontario. JAMA 283(16):2152–2157

16. Lovisi GM, Mann AH, Coutinho E, Morgado AE (2003) Mental illness in an adult sample admitted to public hostels in the Rio de Janeiro metropolitan area, Brazil. Soc Psychiatry Psychiatr Epi-demiol 38:493–498

17. Fasawe D (2012) Developing services for the wandering mentally ill in an African city-the Lagos. Afr J Psychiatry 15:156

18. Krausz RM, Clarkson AF, Strehlau V, Torchalla l, Li K, Schuetz CG (2013) Mental disorders, service use and barriers to care among 500 homeless people in 3 different urban settings. Soc Psychiatry Psychiatr Epidemiol. doi:10.1007/500127-012-0612-8

19. Martens W (2001) A review of physical and mental health in homeless persons. Public Health Rev 29:13–33

20. Langle G, Egerter B, Albrecht F, Petrasch M, Buchkremer G (2005) Prevalence of mental illness among homeless men in the community. Soc Psychiatry Psychiatric Epidemiol 40:382–390

21. Philippot P, Lecocq C, Sempoux F, Nachtergael H, Galand B (2007) Psychological research on homelessness in Western Eur-ope: a review from 1970–2001. J Soc Issues 63(3):483–504

22. Fazel S, Khosla V, Doll H, Geddes J (2008) The prevalence of mental disorders among the homeless in western countries: Sys-tematic review and meta-regression analysis. PLoSMed 5(12):225

23. Rosenheck R, Seibyl CL (1998) Homelessness: health service use and related costs. Med Care 36:1256–1264

24. McQuistion H, Finnerty M, Hirschowitz J, Susser E (2003) Challenges for psychiatry in serving homeless people with psy-chiatric disorders. Psychiatr Serv 54:669–676

25. Salize H, Horst A, Dillmann-Lange C, Killmann U, Stern G, Wolf I, Henn F, Rossler W (2001) Needs for mental health care and service provision in single homeless people. Soc Psychiatry Psychiatr Epidemiol 36:207–216

26. Gonzales G, Rosenheck RA (2002) Outcomes and service use among homeless people with serious mental illness and substance abuse. Psychiatr Serv 53:437–446

27. Lauber C, Lay B, Rossler W (2006) Homeless people at disad-vantage in mental health services. Eur Arch Psychiatry Clin Neurosci 256:138–145

28. Henry JM, Boyer L, Belzeaux R, Baumstarck-Barrau K, Samv-elian JC (2012) Mental disorders among homeless people admitted to a French psychiatric emergency service. Psychiatr Serv 61:264–271

29. Lehman AF, Kernan E, Deforge BR, Dixon L (1995) Effects of homelessness on the quality of life of persons with severe mental illness. Psychiatr Serv 46:922–926

30. Madianos M, Economou M, Alexiou T, Stefanis C (2011) Depression and economic hardship across Greece in 2008 and 2009: two cross-sectional surveys nationwide. Soc Psychiatry Psychiatr Epidemiol 46:943–952

31. Economou M, Madianos M, Peppou L, Thereritis C, Stefanis C (2012) Suicidality and economic crisis in Greece. The Lancet 380:337–338

32. Hellenic Statistical Authority (2006) Results from the population census 2001. HAS Printing Office, Athens

33. Edgar W, Doherty J, Meert H (2009) European review of sta-tistics on homelessness in Europe. FEANTSA, Brussels

34. Praksis NGO (2011) Report on Athens in the inner city of Athens. Mimeo, Athens

35. Konstantakopoulos G, Kakoulas I, Valma V, Stamatogiannop-oulou E, Giotakos O, Katsadoros K (2003) Mental disorders and dual diagnosis in a sample of homeless people in Athens. Ann Gen Hosp Psychiatry 2(Suppl 1):113–114

36. Sheehan D, Lecrubier Y, Sheehan KH, Amozim P, Weiller E, Hergueta T, Baker R, Dunbarg C (1998) Mini International Neuropsychiatric Interview: the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. J Clin Psychiatry 59(suppl 20):22–33

37. Papadimitriou GN, Berati S, Matsoukas T, Soldatos C (2008) Mini International Neuropsychiatric Interview (M.I.N.I.). Greek version 5.0.0 (DSM-IV). University of Athens Department of Psychiatry Eginition Hospital, Athens

38. Foldstein MF, Foldstein SE, Mc Hugh PR (1975) Mini Mental State: a practical method for grading the cognitive state of patients for the clinician. J Psychiatr Res 12:189–198

39. Fleiss JL (1971) Measuring nominal scale agreement among many raters. Psychol Bull 76:378–382

40. Padgett DK, Struening EL (1992) Victimization and traumatic injuries among the homeless: associations with alcohol, drug and mental problems. Am J Orthopsychiatry 62:525–534

41. Munoz M, Panadero S, Santos EP, Quiroga MA (2005) Role of stressfull life events in homelessness: an intragroup analysis. Am J Comm Psychol 35:81–88

42. Fischer P, Shapiro S, Breakey WR, Anthony JC, Kramer M (1986) Mental health and social characteristics of the homeless: a survey of Baltimore shelter users. Am J Public Health 76:519–552

43. Haugland G, Siegel C, Hopper K, Alexander MJ (1997) Mental illness among homeless individuals in a suburban county. Psy-chiatr Serv 48:504–509

44. Greenberg GA, Rosenheck RA (2008) Jail Incarceration, home-lessness, and mental health: a national study. Psychiatr Serv 59:170–177

45. Madianos M, Madianou D (1991) The Greek family paradigm: implications for family therapy. Neur et Psychiatrica 12:132–138

46. Wittchen HU, Jacobi F, Rehm J, Gustavsson A, Svensson M, Jönsson B, Olesen J, Allgulander C, Alonso J, Faravelli C, Fratiglioni L, Jennum P, Lieb R, Maercker A, van Os J, Preisig M, Salvador-Carulla L, Simon R, Steinhausen HC (2011) The size and burden of mental disorders and other disorders of the brain in Europe 2010. Eur Neuropsychopharmacol 21:655–679

47. Madianos MG, Tomaras V, Kapsali A, Vaidakis N, Vlachonikolis J, Stefanis C (1988) Psychiatric Case identification in two Athenian communities: estimation of the probable prevalence. Acta Psyciatr Scandinavica 78:24–31

48. Madianos MG, Madianou D, Stefanis C (1987) Prevalence of mental disorders and utilization of mental health services in two areas of greater Athens. In: Cooper B (ed) Psychiatric Epidemiol-ogy: Progress and Prospects. Croom Helm, London, pp 372–386

49. Mavreas V, Beiss A, Moyias A, Rigoni F, Lyketsos G (1986) Prevalence of psychiatric disorders in Athens: a community study. Soc Psychiatry 21:172–181

50. Madianos MG (2002) Deinstitutitionalization and the closure of public mental health hospitals: the pragmatics of psychiatric reform in Greece. Int J Mental Health 31:66–75

51. Madianos MG, Christodoulou G (2007) Reform of the mental health care system (1984–2006). Intern Psychiatry 4:16–19

52. Madianos M, Stefanis C (1992) Changes in the prevalence of symptoms of depression and depression across Greece. Soc Psychiatry Psychiatr Epidemiol 27:211–219

53. Mavreas V, Scapinakis P (2012) Panhellenic epidemiological study on psychopathology of adult population in Greece. Official report. Department of Psychiatry, University of Ioanina, Ioanina, Greece

54. European Observatory on Drug and Alcohol Use (2010) Annual report on drugs and alcoholic beverages in Greece. University Mental Health Institute, Athens

55. Kokkevi A, Fotiou A, Richardson C (2007) Drug use in the general population of Greece over the last 20 years: results from nationwide household surveys. Eur Addict Res 13:167–176

56. Wolf J, Burnam A, Koegel P, Sullivan G, Morton S (2001) Changes in subjective quality of life among homeless adults who obtain housing: a prospective examination. Soc Psychiatry Psychiatr Epidemiol 36:391–398

57. Madianos M, Zartaloudi A, Alevizopoulos G, Katostaras T (2011) Attitudes towards help-seeking and duration of untreated mental disorders in a sectorized Athens area of Greece. Community Ment Health J 47:583–593