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Psychiatric symptoms, psychological distress and somatic comorbidity among remand prisoners in Switzerland

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ABSTRACT

Objective: The aims of this study were to determine the prevalence of psychiatric symptoms and complaints among remand prisoners in Switzerland and to analyze the relationships between psychiatric symptoms, physical health and substance abuse problems in this population.
Method: The medical files of all detainees attending the prison health service in 2007 were reviewed. Identified health problems were coded using the International Classification of Primary Care (ICPC-2). Descriptive statistics and measures of association were computed.
Results: A total of 1510 files were analyzed. Several associations between psychological symptoms (anxiety and insomnia) and physical health problems (skin, respiratory and circulatory) were observed. Substance abuse was also frequently associated with somatic health problems.
Conclusions: These data provide the first comprehensive description of the mental health of detainees in Switzerland's largest remand prison. Our findings emphasize the need for coordinated health care services in detention settings.

Several studies conducted during the last two decades have shown an increased prevalence of mental disorders among prisoners, compared with rates observed in the general population (Fazel & Lubbe, 2005). A systematic review and meta-analysis published in 2002 concluded that, typically, about one in seven prisoners in Western countries has psychotic illnesses or major depression (Fazel & Danesh, 2002). By comparison, in a large sample of the general population of six European countries the 12-month prevalence of major depression or of any mental disorder was 3.9% and 9.6% respectively (Alonso et al., 2004). Prisoners are about ten times more likely to have antisocial personality disorder than the general population (Fazel & Danesh, 2002). In their meta-analysis, 47% of male prisoners and 21% of female prisoners were diagnosed with antisocial personality disorder. There was substantial heterogeneity between studies, attributable to methodological and cross-national differences. Most studies of psychiatric disorder in prisoners have shown a high prevalence of schizophrenic disorders and other psychotic illnesses. Reviewing 12 recent studies, Nielssen and Misrachi reported a prevalence of psychotic illnesses among remand prisoners ranging between 2.7% and 10% and among sentenced inmates between 1.7% and 8% (Nielssen & Misrachi, 2005).

A review of the literature addressing substance abuse and dependence in prisoners showed a marked heterogeneity among studies, but, globally, prisoners are at an increased risk for drug and alcohol problems compared with the general population. The estimates of prevalence for alcohol abuse and dependence in male prisoners ranged from 18% to 30% and 10% to 24% in female prisoners. The prevalence estimates of drug abuse and dependence varied from 10% to 48% in male prisoners and 30% to 60% in female prisoners. (Fazel, Bains & Doll, 2006). More specifically, several studies have noted strong associations between offending behaviour and heroine and cocaine use (Stewart, 2009).

Suicide is an omnipresent preoccupation in detention and numerous studies describe the increased rates of suicide that exist in jails and prisons in several countries (Wortzel, Binswanger, Anderson, & Adler, 2009). Several studies have shown that age-standardized rates of suicide among male prisoners are between five to eight times higher than in the general population (Blaauw, Kerkhof & Hayes, 2005), and sometimes as high as fourteen times higher (Shaw, Baker, Hunt, Moloney & Appleby, 2004). In a systematic review, risk factors associated with suicide in prisoners included white ethnicity, being male, being married, occupation of a single cell, suicidal ideation, history of attempted suicide, having a current psychiatric diagnosis, receiving psychotropic medication and having a history of alcohol use problems (Fazel, Cartwright, Norman–Nott & Hawton, 2008).

Data indicate that the number of inmates with mental disorders is rising (Dressing, Kief & Salize, 2009). Several reasons account for this

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increasing prevalence of mental disorders among prisoners. Harsh incarceration conditions causing acute stress is probably one of them, but most authors underline the current trend to criminalize severely mentally ill persons (Okasha, 2004). In other words, there seems to be a shift of psychiatric inpatient care from hospitals to jails and prisons (Lamb & Weinberger, 2005). In most European countries, general psychiatric beds decrease while forensic psychiatric beds and places in forensic institutions tend to increase (Priebe et al., 2005). This trend, alternatively called "trans-institutionalisation or "re-institutionalisation", is probably related more to changes in global social attitudes than to true modifications in psychopathology and morbidity. The reality of this phenomenon is, however, contested by several authors. Further understanding of this evolution would require a detailed analysis of the interaction among general psychiatry, forensic psychiatry and the prison sector (Salize, Schanda & Dressing, 2008). Prison prevalence of psychiatric morbidity may mirror general trends in the society regarding services for mentally ill subjects (Andersen, 2004). Barriers to community care for offenders' (Lamberg, 2004), repeated incarcerations among mentally ill individuals (Baillargeon, Binswanger, Penn, Williams, & Murray, 2009) and the observation that prisons are treating mentally ill people who were off treatment at the time of arrest (Wilper et al., 2009) represent additional relevant factors.

Importantly, most prevalence studies were conducted in North America and Scandinavia. Epidemiologic data are also available for England (Birmingham, Mason & Grubin, 1996), Australia (Butler, Andrews, Allnutt, Sakashita, Smith & Basson, 2006) and New Zealand (Brinded, Simpson, Laidlaw, Fairley & Malcolm, 2001). It is problematic to generalize these figures because criminal justice systems vary across countries and because types of prisoners (sentenced or on remand) and possibilities of specialized psychiatric care differ from one institutional system to another. Structured information on prison mental health care and psychiatric disorders in jails and prisons is lacking in most European countries (Dressing et al., 2009). In France, a study was conducted among a random sample of 800 incarcerated males. Each subject was assessed for psychiatric diagnosis by two clinicians, one using a semi-structured interview, the other clinician completing the procedure with an opened clinical interview (Falissard et al., 2006). Prevalence rates for a diagnosis given independently by both clinicians and for a consensual diagnosis were respectively: 3.8% (6.2%) for schizophrenia, 17.9% (24%) for major depressive disorder, 12.0% (17.7%) for generalized anxiety and 10.8% (14.6%) for drug dependence. The authors concluded that psychiatric diagnosis can be difficult to interpret in prison, especially using traditional standardized interviews. In a sample of 80 male prisoners in Greece, the prevalence of mental disorders was more than 78% (Fotiadou, Livaditis, Manou, Kaniotou, & Xenitidis, 2006). The main diagnoses were: anxiety disorder (37.5%); major depression (27.5%); antisocial personality disorder (37.5%); alcohol dependence (26.3%); opiate dependence (27.5%) and schizophrenic or bipolar disorder (11.2%). Twelve prisoners (15%) had an IQ below 75. In Italy, prevalence of either substance use or another psychiatric disorder was 54.3%, while the comorbidity rate was 20.9% among a sample of 302 male detainees (Piselli, Elisei, Murgia, Quartesan, & Abram, 2009). In the Netherlands, 57% of 191 randomly selected prisoners suffered from one or more mental disorders (Bulten, Nijman & van der Staak, 2009). For non-Western countries, reliable data are almost non existent but there are indications suggesting that the prevalence of mental disorders in jails and prisons is similar to what is observed in Europe and North America (Assadi et al., 2006; Fatoye, Fatoye, Oyebanji & Ogunro, 2006; Banerjee, Sengupta, & Ray, 2009).

Another important issue is that prisoners are prone to suffer from multiple pathologies, associating mental disorders (psychotic, depressive or personality disorder), substance abuse disorders and general medical conditions such as transmissible diseases. This concurs to an increased morbidity and mortality, both in incarcerated people and released prisoners (Binswanger et al., 2007; Kariminia et al., 2007). The association between somatic and mental disorders in this population has not, however, been extensively studied before.

There are virtually no available recent epidemiologic data for Swiss jails and prisons, despite well staffed prison medical services in several centres. A study conducted in 1989 reported high levels of psychiatric symptoms in 57% of a sample of 208 male prisoners, using the General Health Questionnaire (GHQ) (Harding & Zimmermann, 1989). More recently, two independent retrospective studies addressed self-injurious behaviours in the same centre in Geneva. In the first study, suicidal gestures were associated with age less than 25 years, previous suicide attempts, a past history of psychiatric treatment and opiate drug dependence (Schaller, Zimmermann & Raymond, 1996). In the second study, 161 self-aggressive behaviours were recorded over a 15-month period. All the detainees involved were male, with a mean age of 25 years. The most frequent self-aggressive behaviours were cutting, strangulation and fire setting (Ammar, Borras & Eytan, 2008).

The aim of the present study was to document the epidemiology of mental disorders and comorbidities in the largest remand prison of this country. It was also to offer a detailed description of the association between mental health problems, substance abuse and somatic disorders. A secondary objective of the study was to evaluate the feasibility of a systematic medical screening using the ICPC -2 in prison.

1. Methods

1.1. Setting

The study took place in the remand prison of the Geneva district, situated in the French speaking part of Switzerland. This centre was built 30 years ago. Initially conceived for 270 places, the average number of inmates is currently between 450 and 500, with a mean occupation rate of 169% in 2008. According to the prison census, detainees presented the following characteristics at the time the study took place: Between 10% and 20% of detainees were sentenced prisoners waiting to be transferred to another institution. The population was in majority young (60% of detainees were under 30 years of age) and male (93%). Almost 90% of detainees were of foreign origin. The main regions of origin were North Africa (20%), Eastern Europe and the Balkans (20%), Sub-Saharan Africa (20%) and the European Union (20%). More than 100 different nationalities were represented. Most detainees were foreigners officially living abroad, who did not have permission to be in Switzerland at the time of the offence (66%). Incarcerations were shorter than 4 months in 55% of cases, due to release or transfer to another prison after sentencing.

The medical service of the prison is composed of general practitioners, nurses, psychiatrists and psychologists. Seventy to 80% of the mean 2300 detainees admitted annually receive medical care. All detainees admitted to the facility are submitted to a health care assessment by primary health care nurses within 24 hours of their admission. This assessment includes screening questions for the most frequent general medical conditions, infectious diseases, exposure to violence and suicidal ideation. When necessary, nurses refer detainees immediately to a physician. At any time, inmates can ask for medical consultation and are then addressed to a primary care physician or directly to a psychiatrist in case of obvious severe symptoms. The independence of caregivers is guaranteed by the attachment of the service to the Geneva University Hospitals rather than to the prison administration.

1.2. Instruments and design

The medical files of all detainees attending the prison health service in 2007 were reviewed and coded using the French version of the international classification of primary care, second edition (ICPC-2)

(Okkes, Jamoulle, Lamberts & Bentzen, 2000). In primary care settings, ICPC-2 has benefits over the International Classification of Diseases (ICD) for classifying problems that do not have a precise diagnosis. Indeed, both symptoms and diagnoses are taken into account with the ICPC. The instrument allows ordering of clinical data in an episode of care structure. In several studies, ICPC has been found to be adequate, reliable, and feasible for use in primary health care settings. It is widely used in Australia, through the "BEACH" (Bettering the Evaluation and Care of Health) program, a continuous national study of general practice that has been going on for several years (Britt, Miller & Bayram, 2007). ICPC-2 has a biaxial structure with 17 chapters on one axis and seven components, which are part of each chapter, on the other axis. ICPC-2 chapters are all based on body systems following the principle that localisation has precedence over aetiology. The classification contains two additional chapters, one for psychological problems and one for social problems. Components deal with issues such as preventive or administrative procedures, referrals and other reasons for encounter. For the present study, only two components (symptoms and complaints, and diagnoses) of the second axis were recorded. Rarely reported disorders, for example bipolar disorder, were excluded from the analysis.

The three first questions of the Alcohol Use Disorders Identification Test (AUDIT) (Bradley et al., 2003) were used for assessing alcohol use. The cut-off score (5 points) for a diagnosis of alcohol dependence was chosen according to the criteria proposed by Rumpf (Rumpf, Hapke, Meyer, & John, 2002) and Dawson (Dawson et al., 2005). Regarding other substances of abuse, the screening items of the questionnaire from the Council of Europe Pompidou Group multi-city study were used (Nagler, 1987). Authors of the present study had previous experience with this questionnaire in prison settings (Niveau & Ritter, 2008). For cocaine, heroine and methadone, either past or current abuse was sufficient for the diagnosis of abuse. The screening questions were: "Did you take the substance during the last month?" and "Have you ever taken the substance during your lifetime?" For tobacco, cannabis and benzodiazepines, only current abuse was considered. The questions were: "Do you smoke one cigarette a day or more?", "Do you take cannabis twice a week or more?" and "Do you take benzodiazepines twice a week or more?" We did not distinguish between prescribed and illicitly obtained benzodiazepines, since dependant detainees usually use both. Purely somatic chapters will be presented in another publication.

The methodology and the instrument were pretested over a 3-month period (October 2006 to December 2006). Approximately 400 files were analyzed during the pretest. It informed improvements to be made to the technical procedure and helped harmonize the use of the ICPC-2 within the research team. All ICPC-2 sheets correctly completed by a physician over a 1-year period (January 2007 to December 2007) were analyzed. We excluded files exclusively limited to the nurse health care assessment upon admission to the prison. Socio-demographic data (age, sex, nationality) were also recorded. The study sample did not significantly differ from the whole prison population regarding socio-demographic data. All detainees with psychological complaints or severe psychiatric symptoms were seen by either the psychiatrist or the psychologist of the medical service during the period of the study, but no additional diagnostic instrument was used. One coder (D.B.) reviewed all the files and followed strict coding rules established by the research team at the initiation of the study. All the health problems for which medical or psychological care had been provided during a detainee's stay had been summarized upon closing the file using the ICPC codes. Therefore, even though the retrieval of codes was retrospective, the actual coding could be said to have been undertaken in a prospective manner. Coding doubts were discussed and resolved during regular meetings both with another coder in a different detention setting (DMH) and the entire research team. All data were recorded anonymously. During the period of the survey, the ICPC-2 was used systematically for all detainees seen at the medical facility of the prison and coding did not involve any additional medical consultations for the subjects.

The AUDIT and drug related questions were administered by the usual care giver during a consultation. This was in fact a formalization of routinely asked questions. Allegations of violence and self-aggressive behaviours are routinely investigated during the admission health care assessment and during the subsequent consultations when pertinent. The research project was approved by the Ethics Committee of the University Hospitals of Geneva. Statistical analyses were done with S-Plus 7.0 Enterprise Developer (Insightful Corp. Seattle, WA, USA). Chi square tests were used to measure the association between two variables. Default type one error rates for the tests were set at 5%.

2. Results

2.1. Prevalence of psychological symptoms

A total of 2195 subjects were in contact with the medical unit during the period of the study. Six-hundred eighty five detainees (31.2%), seen only by nurses, had no medical file and were thus excluded from the analysis. Five percent of the remaining files were excluded from the analysis because of incomplete information. Ten percent of people were incarcerated twice or more during the period of the study. In these cases, a synthesis of the information contained in successive files was done and subjects were included only once in the study. This led to a total of 1510 files being analyzed. Prevalence of psychological symptoms and drug abuse is presented in Table 1. Subjects were in majority male (95%), young (mean 30 years of age, median 28 years, ranging from 18 to 82 years) and from very diverse nationalities and ethno-cultural backgrounds. Almost half (45.8%) presented psychological symptoms or complaints, women slightly

Table 1
Prevalence of psychological symptoms and drug abuse, $N = 1510$.

		Male $n = 1434$		Female $n = 76$			Total	$N = 1510$
		N	% (95% CI)	*N*	% (95% CI)	*p*	*N*	% (95% CI)
Psychological symptoms, independently of substance abuse		649	45.3 (42.7–47.8)	43	56.6 (45.4–67.7)	.054	692	45.8 (43.3–48.3)
Substance abuse								
	Tobacco	996	69.5 (67.1–71.8)	45	59.2 (48.2–70.3)	.060	1041	68.9 (66.6–71.3)
	Alcohol	612	42.7 (40.1–45.2)	10	13.2 (5.6–20.8)	<.001	622	41.2 (38.7–43.7)
	Cannabis	527	36.8 (34.3–39.2)	15	19.7 (10.8–28.7)	.003	542	35.9 (33.5–38.3)
	Cocaine	394	27.5 (25.2–29.8)	8	10.5 (3.6–17.4)	.001	402	26.6 (24.4–28.9)
	Heroine	250	17.4 (15.5–19.4)	12	15.8 (7.6–24.0)	.712	262	17.4 (15.4–19.3)
	Benzodiazepine	457	31.9 (29.5–34.3)	13	17.1 (8.6–25.6)	.007	470	31.1 (28.8–33.5)
Alleged victim of violence by the police	166	11.6 (9.9–13.2)	7	9.2 (2.7–15.7)	.528	173	11.5 (9.9–13.1)	

Table 2
Associations between psychological symptoms, age, sex and general medical conditions.

		Psychological symptoms		Anxiety		Insomnia		Alcohol		Tobacco		Cocaine		Heroine		Cannabis		BZD		Self-aggressive behaviour	
		%	p	%	p	%	p	%	p	%	p	%	p	%	p	%	p	%	p	%	p
Sex	Men	45	.054	15	.011	21	.930	42	<.001	69	.060	27	.001	17	.712	37	.003	32	.007	2.2	NA
	Women	57		26		21		13		59		11		16		20		17		1.3	
Age	18 to 22	43	.003	14	.001	20	.904	51	.001	75	<.001	29	<.001	10	<.001	53	<.001	38	<.001	6.2	<.001
	23 to 28	40		13		20		39		63		30		21		37		26		0.5	
	29 to 34	48		15		22		40		74		32		26		37		36		1.2	
	35 +	52		22		22		35		64		16		14		17		26		0.5	
Alcohol abuse	Yes	51	.002	16	.984	24	.035			84	<.001	41	<.001	16	.414	55	<.001	46	<.001	3.5	.001
	No	42		16		20				58		17		18		23		21		1.1	
Tobacco use	Yes	47	.120	15	.257	22	.150	50	<.001			33	<.001	23	<.001	47	<.001	40	<.001	2.5	.128
	No	43		17		19		21				12		5		11		11		1.3	
Skin problems	Yes	47	.558	16	.947	26	.001	37	.017	60	<.001	25	.308	12	<.001	33	.098	25	<.001	2.6	.352
	No	45		16		19		44		75		28		21		38		35		1.8	
Respiratory problems	Yes	51	.052	21	.004	29	<.001	37	.117	63	.022	27	.984	12	.006	33	.280	27	.078	1.0	.131
	No	45		15		20		42		70		27		19		37		32		2.4	
Circulatory problems	Yes	49	.454	26	.001	22	.820	37	.304	58	.003	21	.105	6	<.001	21	<.001	24	.051	0.7	NA
	No	46		15		21		42		70		27		18		37		32		2.3	
Alleged violence	Yes	42	.308	13	.320	20	.539	39	.484	57	<.001	24	.355	10	.010	38	.625	27	.171	3.5	NA
	No	46		16		22		42		70		27		18		36		32		1.9	

NA: Chi square test not applicable.

more frequently than men (56.6% vs. 45.3% respectively). Smoking was highly prevalent in this sample (68.9%). Alcohol, cannabis, benzodiazepine and cocaine abuse were also frequent (41.2%, 35.9%, 31.1% and 26.6% respectively). Apart from heroine, all substance abuse problems were more frequent among men than among women. Prevalence of allegations of violence by the police or guards was 11.5% and only slightly higher among men than among women (11.6% vs. 9.2%). Overall, 692 mental ICPC items were recorded. The ratio between the number of physical items and the number of mental items was approximately 3.5.

2.2. Psychological symptoms and medical conditions

Associations between psychological symptoms, substance use, age, sex and the most common general medical conditions are presented in Table 2. Several statistically significant associations should be noted. Compared with men, women more frequently required care for anxiety and less often for alcohol, cocaine, cannabis and benzodiazepines abuse. Younger prisoners were more prone than older ones to abuse alcohol, cannabis and benzodiazepines and to adopt self-aggressive behaviours (for example scarification), while inmates aged 35 years or more complained more often of diverse psychological symptoms, including anxiety. Heroine and cocaine abuse was also more common in older prisoners than in young ones. Comorbidity between tobacco, alcohol and other substance abuse was very common. Past alcohol abuse was associated with a cohort of problems and behaviours, including insomnia, smoking and self-aggression. We observed several significant associations between anxiety, insomnia, various abused substances and general medical health conditions including skin, respiratory and circulatory problems.

2.3. Mental disorders and medical conditions

Associations between mental disorders, age, sex and the most common general medical conditions are presented in Table 3. Depressive disorders were overrepresented among female prisoners. Personality disorders were more prevalent among younger prisoners. A history of alcohol abuse was associated with posttraumatic stress disorder (PTSD), adjustment disorders and personality disorders. Smoking was associated with adjustment and personality disorders. Respiratory problems were associated with adjustment disorders.

There were generally no significant associations between nationality and any of the examined complaints or diagnoses, even when nationalities were grouped by regions of origin (European Union and Switzerland, Africa, Americas, Asia and miscellaneous), except for slightly higher prevalence of alcohol, cocaine, or benzodiazepine use among African and Asian inmates.

3. Discussion

3.1. Context of the study

This study provides the first detailed description of the mental health problems for which detainees received care in the largest Swiss remand prison. It is also the first description of the association of the mental health problems with somatic health problems in a large sample of detainees. Our findings confirm the high prevalence of mental health problems in this population and highlight frequent associations with somatic health problems thus emphasizing the need for coordinated health care services in these settings.

3.2. Comparisons with other studies

A wide range of prevalence rates of mental disorders among detainees are found in published studies. This appears to be due to differences in penitentiary laws and practices across countries, but also to a variety of methodological approaches used in these studies. Regarding screening and diagnosis, the Structured Clinical Interview for DSM-IV (SCID) (Assadi et al., 2006; Piselli et al., 2009; Steadman, Osher, Robbins, Case & Samuels, 2009), the Composite International Diagnostic Interview for mental illness (CIDI) (Simpson, Brinded, Fairley, Laidlaw, & Malcolm, 2003), the Medical Outcome Survey Short Form 36 (SF-36) (Black et al., 2007), the Mini International Neuropsychiatric Interview (MINI) (Falissard et al., 2006; Gunter et al., 2008; Bulten et al., 2009), the General health Questionnaire (GHQ-30) (Fatoye et al., 2006) and retrospective data from medical information systems (Baillargeon et al., 2009) were used. To our knowledge, our study is the first to use the ICPC. Our choice of this classification was justified by the fact that our prison health service is mainly a primary care service and not predominantly a specialized psychiatric service in which all subjects are submitted to a detailed psychiatric diagnostic examination. Therefore, comparisons between our cohort and figures reported from other centres should be interpreted with caution. We noticed that both methodologies and results of published studies are highly heterogeneous. This observation should encourage researchers conducting prevalence surveys in places of detention to harmonize their choices

Table 3
Associations between mental disorders, age, sex and general medical conditions.

		Depressive disorder		Psychosis		Posttraumatic stress disorder		Adjustment disorder		Personality disorders	
		%	p	%	p	%	p	%	p	%	p
Sex	Men	9.6	<.001	1.2	NA	1.5	NA	6.3	NA	7.7	.198
	Women	22.4		5.3		0		10.5		11.8	
Age	18 to 22	5.7	<.001	0.8	NA	1.6	NA	4.7	.049	12.4	<.001
	23 to 28	8.1		1.5		2.0		5.1		4.3	
	29 to 34	9.7		0.6		1.5		7.3		8.5	
	35 +	17.2		2.5		0.8		9.0		6.8	
Alcohol abuse	Yes	9.8	.624	1.1	.461	2.6	.002	3.9	.001	11.6	<.001
	No	10.6		1.6		0.7		8.3		5.4	
Tobacco abuse	Yes	10.9	.260	1.2	.483	1.5	.700	5.5	.017	9.7	<.001
	No	9.0		1.7		1.3		8.7		4.1	
Skin problems	Yes	9.7	.559	1.5	.711	0.8	.116	6.1	.643	7.0	.264
	No	10.6		1.3		1.8		6.7		8.6	
Respiratory problems	Yes	10.6	.815	1.3	.918	1.7	NA	10.3	.004	8.3	.797
	No	10.2		1.4		1.4		5.5		7.9	
Circulatory problems	Yes	11.9	.524	1.5	NA	1.5	.980	8.1	.412	6.7	.564
	No	10.1		1.4		1.5		6.3		8.1	
Alleged violence	Yes	11.0	.741	0	NA	0.6	NA	6.4	.940	8.7	.708
	No	10.2		1.6		1.6		6.5		7.9	

NA: Chi square test not applicable.

of psychometric and diagnostic instruments, in order to underline clinically significant differences between sites.

As 45.8% of detainees presented psychological symptoms or complaints, our results fall inside the range found in the medical literature. For European countries, prevalence estimations for mental disorders among prisoners are between 27% and 78% (Fotiadou et al., 2006; Dressing et al., 2009). Our results are also congruent with available data regarding substance abuse and comorbidity figures. Since alcohol is not readily available in prison, problems with this substance were either related to withdrawal symptoms or abuse prior to incarceration. Smoking is usually poorly documented in prison settings but, as Butler et al. pointed out, tobacco smoking is part of prison life and culture. This explains smoking rates of up to 90% as described in Australian prisons (Butler, Richmond, Belcher, Wilhelm & Wodak, 2007). With a prevalence of tobacco smoking of almost 70%, which is more than twice the rate of smoking in the Swiss community, our study confirms the need for targeted interventions in prison such as proposed in other countries. After exploring the issue through focus groups, Richmond et al. in Australia concluded that inmate smoking cessation programs need to address the enmeshment of tobacco in prison life, improve availability of pharmacotherapies (for example nicotine patches) and a free telephone helpline providing information on stopping smoking, provide non-smoking cells and areas within prisons, encourage physical activity for inmates and maintain monitoring of smoking cessation status after release (Richmond, Butler, Wilhelm, Wodak, Cunningham & Anderson, 2009). It appears that prison inmates are able to quit or reduce tobacco consumption while in prison but any smoking cessation intervention in this setting needs to address prison-specific issues such as boredom, stress, transfers to other prisons, court appearances, and isolation from family and friends (Richmond, Butler, Belcher, Wodak, Wilhelm, & Baxter, 2006).

Since women represent only a small fraction of those incarcerated, few studies compared rates of mental disorders between sexes in the same places of detention (Lewis, 2006). However, vast disparities exist in the distribution of imprisoned women between countries. It is estimated that, worldwide, correctional facilities house in excess of half a million females (Moloney, van den Bergh & Moller, 2009). There is, however, evidence that female offenders have a higher prevalence of substance abuse and major depression than male offenders (Jordan, Schlenger, Fairbank, & Caddell, 1996; Teplin, Abram, & McClelland, 1996). Our study confirms these results and speaks in favour of mental health interventions designed for women in prison. Data from the literature indicate that past traumatisation plays a significant role in the development of psychopathology among incarcerated women (Moloney & Moller, 2009). In a comprehensive behavioural survey of female prisoners, 70% of respondents reported experiencing severe physical violence from child or adolescent caregivers, 59% disclosed any form of child sexual abuse, and 41% described penetrative sex in childhood (Browne, Miller & Maguin, 1999). Additionally, 75% and 35%, respectively, recounted any physical violence by or forced intercourse with an intimate partner, while 77% revealed physical or sexual violence by non-intimates in adulthood. In a study conducted more than 10 years ago in the US, 68% of imprisoned women met the criteria for current or lifetime posttraumatic stress disorder (PTSD), exceeding the prevalence of PTSD among women in the general community by a factor of 7 (Zlotnick, 1997). It is therefore surprising that no case of PTSD was diagnosed among the 76 women included in our study. Insufficient exploration of psychological symptoms reported by women by predominantly male practitioners is a possible explanation. Cultural barriers and stigma associated with sexual abuse among migrant women could also contribute to nondisclosure of traumatic events by female patients.

A major finding of our study is the strong association between physical health problems (skin, circulatory and respiratory), substance abuse and psychological complaints (anxiety and insomnia). While it seems reasonable to accept that physical health problems are consequences of substance abuse problems among detainees (for example skin problems among intravenous heroine users), we hypothesize that poor physical health is also a contributing factor for anxiety and insomnia during detention. In another study involving 163 remand prisoners, physical health worries and complaints were more frequent among insomniac and anxious detainees. In the same study, insomnia was related to daily activities. A significantly higher percentage of non insomniac prisoners than of prisoners complaining of insomnia practiced sports in prison, watched television, and spent their day discussing and meeting other detainees (Elger, 2009). Insomnia in places of detention should not be reduced to a secondary problem related to substance abuse and mental illness, as it appears to be an independent situational problem (Elger, 2007).

More broadly, it is accepted that, in comparison with people in the community, prisoners are far more likely to suffer multiple complex health care needs which combine at different levels of severity (Rutherford & Duggan, 2009). As already shown in Australia, even young offenders are characterized by both extreme social disadvantage and poor physical health (Butler, Belcher, Champion, Kenny, Allerton, & Fasher, 2008). Literature data and our findings highlight the

need for further studies of psychosomatic complaints among detainees. A more comprehensive knowledge of these multiple comorbidities should facilitate the implementation of appropriate integrated health care programs in prison settings. According to Watson et al., essential components of such programs should be health promotion, health screening on arrival in prison with an emphasis on mental health, partnership between health care staff and prison services, education of prison staff, development of a model of prison health care which looks beyond the prison environment to the community and, possibly, telemedicine as a mode of delivering health care (Watson, Stimpson & Hostick, 2004).

3.3. Potential limitations

This study has several limitations. Firstly, we used an observational approach and analysis was performed on a retrospective basis. Secondly, the instrument chosen, ICPC-2, is not sufficient to ensure accurate diagnoses of mental disorders according to the widely used classification systems, ICD-10 (OMS, 1993) or DSM-IV (APA, 1994). Symptoms were recorded with the ICPC-2, but we did not use a diagnostic screening interview. This explains why prevalence of diagnoses, as opposed to symptoms, is lower than usually found in the literature. Despite this limitation, it is noteworthy that the ICPC categories are compatible with the ICD-10 categories (Okkes, Jamoulle, Lamberts & Bentzen, 2000). ICPC was not validated in prison settings, but very few psychometric or diagnostic tools were. On the other hand, the methodology has several strengths. It allowed for inclusion of a large number of detainees in the country's largest remand prison. It also allowed for analysis of comorbidities between mental disorders, substance abuse disorders and general medical conditions in a single survey. The quality of coding was enhanced by thorough pretesting in the pilot study and by using strict coding rules including discussion and resolution of doubts in team meetings.

4. Conclusion

The World Health Organization (WHO) Health in Prisons Project (WHO, 2009) indicates clearly that something must be done to improve healthcare in prisons (Fraser, Gatherer & Hayton, 2009). In their strategic objectives, the WHO raises issues that point towards the need for coordinated care planning in places of detention: according to the WHO, it is important to encourage cooperation and establish integrated work between public health systems, international nongovernmental organizations and prison health systems to promote public health. Other objectives are to assist the reduction of reoffending by encouraging prison health services to contribute fully to each prisoner's rehabilitation, especially, but not exclusively, in relation to drug addiction and mental health problems and to reduce the exposure of prisoners to communicable diseases, thereby preventing prisons becoming focal points of infection. Our study shows a high level of entanglement between substance abuse related disorders, and somatic and mental health problems among detainees. This result supports these WHO recommendations and underlines the needs for coordinated care planning in places of detention. In order to allocate appropriate resources and to target interventions it is essential to document health problems in a variety of settings and institutions, using reproducible methodologies.

References

Alonso, J., Angermeyer, M. C., Bernert, S., Bruffaerts, R., Brugha, T. S., Bryson, H., et al. (2004). Prevalence of mental disorders in Europe: Results from the European Study of the Epidemiology of Mental Disorders (ESEMeD) project. *Acta Psychiatrica Scandinavica. Supplementum*, *420*, 21—27.

Ammar, M. M., Borras, L., & Eytan, A. (2008). Self aggressive-behaviours in prison. *Bulletin Society Science Med Grand Duche Luxemb*, *4*, 503—508.

Andersen, H. S. (2004). Mental health in prison populations. A review—with special emphasis on a study of Danish prisoners on remand. *Acta Psychiatrica Scandinavica. Supplementum*, *424*, 5—59.

APA (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). DC APA: Washington.

Assadi, S. M., Noroozian, M., Pakravannejad, M., Yahyazadeh, O., Aghayan, S., Shariat, S. V., et al. (2006). Psychiatric morbidity among sentenced prisoners: Prevalence study in Iran. *The British Journal of Psychiatry*, *188*, 159—164.

Baillargeon, J., Binswanger, I. A., Penn, J. V., Williams, B. A., & Murray, O. J. (2009). Psychiatric disorders and repeat incarcerations: The revolving prison door. *The American Journal of Psychiatry*, *166*(1), 103—109.

Banerjee, A., Sengupta, P., & Ray, T. K. (2009). Persons with major psychiatric illness in prisons—a three years study. *Journal of the Indian Medical Association*, *107*(1), 14—16.

Binswanger, I. A., Stern, M. F., Deyo, R. A., Heagerty, P. J., Cheadle, A., Elmore, J. G., et al. (2007). Release from prison—a high risk of death for former inmates. *The New England Journal of Medicine*, *356*(2), 157—165.

Birmingham, L., Mason, D., & Grubin, D. (1996). Prevalence of mental disorder in remand prisoners: Consecutive case study. *BMJ*, *313*(7071), 1521—1524.

Blaauw, E., Kerkhof, A. J., & Hayes, L. M. (2005). Demographic, criminal, and psychiatric factors related to inmate suicide. *Suicide and Life-Threatening Behavior*, *35*(1), 63—75.

Black, D. W., Gunter, T., Allen, J., Blum, N., Arndt, S., Wenman, G., et al. (2007). Borderline personality disorder in male and female offenders newly committed to prison. *Comprehensive Psychiatry*, *48*(5), 400—405.

Bradley, K. A., Bush, K. R., Epler, A. J., Dobie, D. J., Davis, T. M., & Sporleder, J. (2003). Two brief alcohol-screening tests from the Alcohol Use Disorders Identification Test (AUDIT): Validation in a female Veterans Affairs patient population. *Archives of Internal Medicine*, *163*(7), 821—829.

Brinded, P. M., Simpson, A. I., Laidlaw, T. M., Fairley, N., & Malcolm, F. (2001). Prevalence of psychiatric disorders in New Zealand prisons: A national study. *The Australian and New Zealand journal of psychiatry*, *35*(2), 166—173.

Britt, H., Miller, G., & Bayram, C. (2007). The quality of data on general practice—a discussion of BEACH reliability and validity. *Australian Family Physician*, *36*(1–2), 36—40.

Browne, A., Miller, B., & Maguin, E. (1999). Prevalence and severity of lifetime physical and sexual victimization among incarcerated women. *International Journal of Law and Psychiatry*, *22*(3–4), 301—322.

Bulten, E., Nijman, H., & van der Staak, C. (2009). Psychiatric disorders and personality characteristics of prisoners at regular prison wards. *International Journal of Law and Psychiatry*, *32*(2), 115—119.

Butler, T., Andrews, G., Allnutt, S., Sakashita, C., Smith, N. E., & Basson, J. (2006). Mental disorders in Australian prisoners: A comparison with a community sample. *The Australian and New Zealand journal of psychiatry*, *40*(3), 272—276.

Butler, T., Belcher, J. M., Champion, U., Kenny, D., Allerton, M., & Fasher, M. (2008). The physical health status of young Australian offenders. *Australian and New Zealand Journal of Public Health*, *32*(1), 73—80.

Butler, T., Richmond, R., Belcher, J., Wilhelm, K., & Wodak, A. (2007). Should smoking be banned in prisons? *Tobacco Control*, *16*(5), 291—293.

Dawson, D. A., Grant, B. F., Stinson, F. S., & Zhou, Y. (2005). Effectiveness of the derived Alcohol Use Disorders Identification Test (AUDIT-C) in screening for alcohol use disorders and risk drinking in the US general population. *Alcoholism, Clinical and Experimental Research*, *29*(5), 844—854.

Dressing, H., Kief, C., & Salize, H. J. (2009). Prisoners with mental disorders in Europe. *The British Journal of Psychiatry*, *194*(1), 88.

Elger, B. S. (2007). Insomnia in places of detention: A review of the most recent research findings. *Medicine, Science and the Law*, *47*(3), 191—199.

Elger, B. S. (2009). Prison life: Television, sports, work, stress and insomnia in a remand prison. *International Journal of Law and Psychiatry*, *32*(2), 74—83.

Falissard, B., Loze, J. Y., Gasquet, I., Duburc, A., de Beaurepaire, C., Fagnani, F., et al. (2006). Prevalence of mental disorders in French prisons for men. *BMC Psychiatry*, *6*, 33.

Fatoye, F. O., Fatoye, G. K., Oyebanji, A. O., & Ogunro, A. S. (2006). Psychological characteristics as correlates of emotional burden in incarcerated offenders in Nigeria. *East African Medical Journal*, *83*(10), 545—552.

Fazel, S., Bains, P., & Doll, H. (2006). Substance abuse and dependence in prisoners: A systematic review. *Addiction*, *101*(2), 181—191.

Fazel, S., Cartwright, J., Norman-Nott, A., & Hawton, K. (2008). Suicide in prisoners: A systematic review of risk factors. *The Journal of Clinical Psychiatry*, *69*(11), 1721—1731.

Fazel, S., & Danesh, J. (2002). Serious mental disorder in 23000 prisoners: A systematic review of 62 surveys. *Lancet*, *359*(9306), 545—550.

Fazel, S., & Lubbe, S. (2005). Prevalence and characteristics of mental disorders in jails and prisons. *Current Opinion in Psychiatry*, *18*(5), 550—554.

Fotiadou, M., Livaditis, M., Manou, I., Kaniotou, E., & Xenitidis, K. (2006). Prevalence of mental disorders and deliberate self-harm in Greek male prisoners. *International Journal of Law and Psychiatry*, *29*(1), 68—73.

Fraser, A., Gatherer, A., & Hayton, P. (2009). Mental health in prisons: Great difficulties but are there opportunities? *Public Health*, *123*(6), 410—414.

Gunter, T. D., Arndt, S., Wenman, G., Allen, J., Loveless, P., Sieleni, B., et al. (2008). Frequency of mental and addictive disorders among 320 men and women entering the Iowa prison system: Use of the MINI-Plus. *The Journal of the American Academy of Psychiatry and the Law*, *36*(1), 27—34.

Harding, T., & Zimmermann, E. (1989). Psychiatric symptoms, cognitive stress and vulnerability factors. A study in a remand prison. *The British Journal of Psychiatry*, *155*, 36—43.

Jordan, B. K., Schlenger, W. E., Fairbank, J. A., & Caddell, J. M. (1996). Prevalence of psychiatric disorders among incarcerated women. II. Convicted felons entering prison. *Archives of General Psychiatry*, *53*(6), 513—519.

Kariminia, A., Law, M. G., Butler, T. G., Corben, S. P., Levy, M. H., Kaldor, J. M., et al. (2007). Factors associated with mortality in a cohort of Australian prisoners. *European Journal of Epidemiology*, *22*(7), 417−428.
Lamb, H. R., & Weinberger, L. E. (2005). The shift of psychiatric inpatient care from hospitals to jails and prisons. *The Journal of the American Academy of Psychiatry and the Law*, *33*(4), 529−534.
Lamberg, L. (2004). Efforts grow to keep mentally ill out of jails. *The Journal of the American Medical Association*, *292*(5), 555−556.
Lewis, C. (2006). Treating incarcerated women: Gender matters. *The Psychiatric Clinics of North America*, *29*(3), 773−789.
Moloney, K. P., & Moller, L. F. (2009). Good practice for mental health programming for women in prison: Reframing the parameters. *Public Health*, *123*(6), 431−433.
Moloney, K. P., van den Bergh, B. J., & Moller, L. F. (2009). Women in prison: The central issues of gender characteristics and trauma history. *Public Health*, *123*(6), 426−430.
Nagler, N. A. (1987). The Council of Europe Co-operation Group to Combat Drug Abuse and Illicit Trafficking in Drugs (the Pompidou Group). *Bulletin on Narcotics*, *39*(1), 31−40.
Nielssen, O., & Misrachi, S. (2005). Prevalence of psychoses on reception to male prisons in New South Wales. *The Australian and New Zealand Journal of Psychiatry*, *39*(6), 453−459.
Niveau, G., & Ritter, C. (2008). Route of administration of illicit drugs among remand prison entrants. *European Addiction Research*, *14*(2), 92−98.
Okasha, A. (2004). Mental patients in prisons: Punishment versus treatment? *World Psychiatry*, *3*(1), 1−2.
Okkes, I., Jamoulle, M., Lamberts, H., & Bentzen, N. (2000). ICPC-2-E: The electronic version of ICPC-2. Differences from the printed version and the consequences. *Family Practice*, *17*(2), 101−107.
OMS (1993). *Classification Internationale des Maladies.* Troubles Mentaux et Troubles du Comportement Paris, Masson: Dixième révision. Chapitre V.
Piselli, M., Elisei, S., Murgia, N., Quartesan, R., & Abram, K. M. (2009). Co-occurring psychiatric and substance use disorders among male detainees in Italy. *International Journal of Law and Psychiatry*, *32*(2), 101−107.
Priebe, S., Badesconyi, A., Fioritti, A., Hansson, L., Kilian, R., Torres–Gonzales, F., et al. (2005). Reinstitutionalisation in mental health care: Comparison of data on service provision from six European countries. *BMJ*, *330*(7483), 123−126.
Richmond, R. L., Butler, T., Belcher, J. M., Wodak, A., Wilhelm, K. A., & Baxter, E. (2006). Promoting smoking cessation among prisoners: Feasibility of a multi-component intervention. *Australian and New Zealand Journal of Public health*, *30*(5), 474−478.
Richmond, R., Butler, T., Wilhelm, K., Wodak, A., Cunningham, M., & Anderson, I. (2009). Tobacco in prisons: A focus group study. *Tobacco Control*, *18*(3), 176−182.
Rumpf, H. J., Hapke, U., Meyer, C., & John, U. (2002). Screening for alcohol use disorders and at-risk drinking in the general population: Psychometric performance of three questionnaires. *Alcohol and Alcoholism*, *37*(3), 261−268.
Rutherford, M., & Duggan, S. (2009). Meeting complex health needs in prisons. *Public Health*, *123*(6), 415−418.
Salize, H. J., Schanda, H., & Dressing, H. (2008). From the hospital into the community and back again—a trend towards re-institutionalisation in mental health care? *International Review of Psychiatry*, *20*(6), 527−534.
Schaller, G., Zimmermann, C., & Raymond, L. (1996). Risk factors in self-injurious behavior in a Swiss prison. *Sozial- und Praventivmedizin*, *41*(4), 249−256.
Shaw, J., Baker, D., Hunt, I. M., Moloney, A., & Appleby, L. (2004). Suicide by prisoners. National clinical survey. *The British Journal of Psychiatry*, *184*, 263−267.
Simpson, A. I., Brinded, P. M., Fairley, N., Laidlaw, T. M., & Malcolm, F. (2003). Does ethnicity affect need for mental health service among New Zealand prisoners? *The Australian and New Zealand Journal of Psychiatry*, *37*(6), 728−734.
Steadman, H. J., Osher, F. C., Robbins, P. C., Case, B., & Samuels, S. (2009). Prevalence of serious mental illness among jail inmates. *Psychiatric Services*, *60*(6), 761−765.
Stewart, D. (2009). Drug use and perceived treatment need among newly sentenced prisoners in England and Wales. *Addiction*, *104*(2), 243−247.
Teplin, L. A., Abram, K. M., & McClelland, G. M. (1996). Prevalence of psychiatric disorders among incarcerated women. I. Pretrial jail detainees. *Archives of General Psychiatry*, *53*(6), 505−512.
Watson, R., Stimpson, A., & Hostick, T. (2004). Prison health care: A review of the literature. *International Journal of Nursing Studies*, *41*(2), 119−128.
WHO (2009). *Health in prisons project.* .
Wilper, A. P., Woolhandler, S., Boyd, J. W., Lasser, K. E., McCormick, D., Bor, D. H., et al. (2009). The health and health care of US prisoners: Results of a nationwide survey. *American Journal of Public Health*, *99*(4), 666−672.
Wortzel, H. S., Binswanger, I. A., Anderson, C. A., & Adler, L. E. (2009). Suicide among incarcerated veterans. *The Journal of the American Academy of Psychiatry and the Law*, *37*(1), 82−91.
Zlotnick, C. (1997). Posttraumatic stress disorder (PTSD), PTSD comorbidity, and childhood abuse among incarcerated women. *The Journal of Nervous and Mental Disease*, *185*(12), 761−763.