

Mental health of prisoners: prevalence, adverse outcomes, and interventions



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More than 10 million people are imprisoned worldwide, and the prevalence of all investigated mental disorders is higher in prisoners than in the general population. Although the extent to which prison increases the incidence of mental disorders is uncertain, considerable evidence suggests low rates of identification and treatment of psychiatric disorders. Prisoners are also at increased risk of all-cause mortality, suicide, self-harm, violence, and victimisation, and research has outlined some modifiable risk factors. Few high quality treatment trials have been done on psychiatric disorders in prisoners. Despite this lack of evidence, trial data have shown that opiate substitution treatments reduce substance misuse relapse and possibly reoffending. The mental health needs of women and older adults in prison are distinct, and national policies should be developed to meet these. In this Review, we present clinical, research, and policy recommendations to improve mental health care in prisons. National attempts to meet these recommendations should be annually surveyed.

Introduction

Worldwide, more than 10 million individuals are in prison at any given time, and more than 30 million individuals circulate through prison each year. Research has consistently shown that prisoners have high rates of psychiatric disorders, and in some countries more people with severe mental illness are in prisons than in psychiatric hospitals. Despite the high level of need, these disorders are frequently underdiagnosed and poorly treated. In this structured review, we provide an overview of the epidemiology of psychiatric disorders in prison, summarise information on rates of suicide and violence victimisation and risk factors for these outcomes, and outline evidence-based interventions for mental health care. Based on this review, we propose a series of clinical, research, and policy recommendations. The aim is to provide a broad synthesis of the main issues related to the mental health of adult prisoners, and highlight gaps in evidence and practice. Two special populations are briefly discussed, namely women and older adults. Juveniles in prison have distinct mental health needs, and an overview of these is outside the scope of this Review.

We present the results of a structured search for systematic reviews on prisoner mental health between 2003 and 2015, supplemented by data from large primary studies on individual psychiatric disorders, rates and risk factors for adverse outcomes, and interventions for mental health problems. We have used the terms jails and prisons interchangeably and include individuals who have received a criminal sentence and are detained before trial (but not individuals in police custody or detained for non-criminal reasons, such as immigration centres).

Prevalence

Many primary studies and reviews have documented the high prevalence of most psychiatric disorders in prisoners (table 1); however, caution is warranted when these data are interpreted. First, published studies might overestimate prevalence. Self-report approaches to

clinical diagnosis are problematic. In addition, prisoner populations assessed by lay interviewers have been associated with higher prevalence than those assessed by diagnostic interviews conducted by clinically trained psychiatrists or psychologists.³ Some disorders can be particularly prone to overestimation. One example is attention-deficit hyperactivity disorder, for which heterogeneity between the primary research studies on prevalence is substantial. One systematic review reported that 26% of adult prisoners have an attention-deficit hyperactivity disorder diagnosis,⁴ by contrast with two high quality studies using self-report measures and diagnostic instruments with reported prevalence rates of 17%⁵ and 11%⁶. The disparity in reported rates suggests that the choice of statistical models needs careful consideration when prevalence estimates are pooled. In particular, random-effects models should be used with caution because they weight smaller studies similarly to the larger ones, and if used, they should be complemented with a fixed-effects model, and examination of individual study quality. For some diagnoses, large high quality studies should be prioritised over many smaller investigations that could reflect publication bias. Furthermore, the heterogeneity of prevalence estimates could reflect real differences related to variations in community rates for individual disorders around the world, how the police and courts approach mental illness, incarceration rates for different crimes, and provision of prison health care. Where variations between countries

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For *The Lancet Series* on HIV and related infections in prisoners see www.thelancet.com/series/hiv-in-prisons

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	Men	Women
Psychotic illness ¹	4% (3–4)	4% (3–5)
Major depression ¹	10% (9–12)	14% (10–18)
Alcohol misuse ²	18–30%	10–24%
Drug misuse ²	10–48%	30–60%
Data are % (95% CI) or %.		
Table 1: Prevalence of different psychiatric diagnoses in adult prisoners based on systematic reviews		

is large, pooling of estimates might not be meaningful and prevalence ranges should be provided.

Some prevalence studies of personality disorders in prisoners are problematic for similar reasons. Large high quality studies using clinically based diagnoses have reported prevalence of 7–10%^{7,8} compared with 65% found in reviews of studies that have used diagnostic instruments.³ The discrepancy could be partly explained by the inclusion of antisocial personality disorder, the most common personality disorder in prisoners, for which diagnostic criteria overlap with the reasons for entering prison. Three of these criteria (disregard of norms and rules, low threshold for aggression or violence, and inability to profit from experience) are together highly correlated with criminogenic factors.

A second problem is that many diagnostic instruments have not been validated in prisons, and include items that may not be specific. For example, the MINI diagnostic interview has been extensively used in prison studies in the past 10 years, and without modification can lead to overestimation of mania and obsessive-compulsive disorder rates.⁹ In addition, screening tools could be particularly susceptible to false positives. For example, in an investigation to identify autism spectrum disorders in Scottish prisoners, only 6% of those who screened positive were clinically diagnosed with such disorders.¹⁰ As a result, case identification is poor.¹¹

Despite these caveats, a number of prevalence findings are consistent. The evidence for major depression and psychotic illnesses is the strongest. A 2012 systematic review¹ of around 33 000 prisoners and more than 100 studies found very similar findings to a previous 2002 review³ (3.6% in 2012 and 3.7% in 2002, table 1). According to these reviews, one in seven prisoners has major depression or psychosis, with little change in rates during the past three decades.¹ Another consistent theme, including in low-income and middle-income countries, is the high rate of substance misuse. Research has also shown high rates of comorbidity between mental illness and substance misuse.¹² Such comorbidity worsens the prognosis of the individual psychiatric disorders, and increases repeat offending and premature mortality after release.¹³ A further finding consistently reported is the higher rate of psychiatric disorders, particularly depression¹ and drug dependence,¹⁴ in female prisoners, compared with men. Future prevalence research should focus on special populations, prisoners in low-income and middle-income countries, and investigation of comorbidities. The problem of novel psychoactive drugs, which are common in many prisons, and whether these novel psychoactives exacerbate mental health problems and other risks, requires more research. In England and Wales, the Inspectorate of Prisons stated that novel psychoactive drugs, particularly synthetic cannabinoids, have led to increased violence in prison as a direct result of drug effects or increased bullying due to drug debts.¹⁵ Many of these substances have been

developed in the last 5–10 years, and the sharp increase of prison use partly mirrors community trends, but use may be higher in prison due to their psychoactive effects, relative ease to smuggle, and lack of detection using conventional methods. The difficulties, however, of reliable detection and disincentives to self-report their use mean that innovative designs are required.

The direction of causality for the high prevalence of psychiatric disorders is a key issue, namely whether the excess in rates is caused by prison or whether they are imported into prison. There is evidence for the importation hypothesis because severe mental illnesses are associated with criminality,^{16,17} but more longitudinal studies are needed after entry into prison (panel). One prospective study in English prisons found that symptoms of depression decreased in the months after arrival in prison, but psychotic symptoms remained stable.¹⁹ Although the study was underpowered for categorical psychiatric diagnoses, it suggested that the stresses secondary to criminal conviction and prison entry are not the only explanations for high rates of mental disorder. Self-report data from a national survey of Australian prisoners found that around half those interviewed reported that their mental health improved during their imprisonment.²⁰

Adverse outcomes

Suicide and self-harm

Suicide and self-harm are more common in prisoners than in people in the general community of similar age and gender. The relative risk of death by suicide in male prisoners is about 3–6 times that of the general population, and even higher in female prisoners (with relative risks typically more than 6 times community rates). Explanations for the differences in relative risks between countries are not clear and do not appear correlated with incarceration rates or general population suicide rates.²¹ More widely, suicide numbers are difficult to validate owing to misclassification of deaths by suicide as accidents, unknown or natural deaths, and reluctance in some countries to characterise self-inflicted deaths in custody as suicides. For this reason, we suggest that all-cause mortality in prison could be a better proxy than official suicide rates for international comparisons when countries are included in which suicide reporting in prisons has not been validated. Using data routinely collected in the European Union (EU) by the Council of Europe,^{22–24} we have calculated 3-year all-cause mortality rates in countries with at least two years of data (figure 1). Notable differences exist between western and eastern Europe which could be explained by higher rates of death from infectious diseases in eastern Europe. However, in western Europe, high rates of all-cause mortality in prison for Belgium and Portugal need further examination. For deaths by suicide, France is an outlier with a reported suicide rate of 179 per 100 000 prisoners,²⁵ whereas most countries report around 100 to 150 per 100 000. Another

Panel: Recommendations for clinical practice, research, and policy, based on the findings of this review

Clinical recommendations

- All prisons should have systems in place for the identification of individuals with serious mental health problems, including case finding on arrival to prison and allocation to appropriate level of service (ie, primary or secondary care or transfer to hospital)
- All prisons should have a suicide prevention strategy that includes accurate screening and monitoring of risk after arrival into prison, multi-disciplinary management of high risk prisoners, and staff training
- Evidence-based psychological and pharmacological mental health treatments that are available in the community or developed for prison settings should be provided
- There should be monitoring of substance dependent prisoners, and provision of drug and alcohol acute detoxification on arrival to all prisons
- Methadone or alternative (eg, buprenorphine) maintenance therapy should be available in all prisons with systems in place to link prisoners with appropriate services to continue treatment on release if indicated
- Cognitive behavioural therapy should be provided for relapse prevention of substance misuse
- Prisons should consider provision of trauma-focused and gender-specific interventions to prisoners, particularly if unmet needs are identified
- Minimum standards for meaningful daytime activity (education, courses, and training) should be developed that include the amount and range of these activities

Research recommendations

- Prevalence studies should not be prioritised because there have been more than 100 high quality ones with little variation between and within countries for severe mental disorders
- Longitudinal studies of mental health in prisoners and use of novel psychoactive agents are required
- Screening tools for suicide risk and identification of severe mental illness are required that have false positive rates that will not lead to large numbers of individuals needing further assessment and monitoring where the risks are low. As healthcare resources are limited in prison, how to balance this with the treatment and management of individuals with identified needs will require consideration.
- Funding bodies should consider prison-specific research calls
- Clarification is needed of the most effective pharmacological treatments for common mental disorders in prison (such as post-traumatic stress disorder, anxiety disorders, and depression)

- More evidence is required to determine which psychological therapies are most effective for mental health problems in prison, and whether they can be provided in group-based formats; more research is particularly required for trauma-based treatments in female prisoners
- Research is required on treatment for alcohol-use disorders in prisoners, and also intramuscular naltrexone and oral buprenorphine as opiate substitution therapies
- Evidence-based approaches are needed to divert mentally ill offenders from prison towards community services or hospital depending on mental health needs, particularly women and young people
- Prediction rules or tools need to be developed that will enable prisons to stratify prisoners into risk groups, particularly for mentally disordered individuals in prison

Policy recommendations (including WHO recommendations)¹⁸

- Basic principles of human and prison rights should be adhered to
- Health care services in prison should be equivalent to those available in the community; however, as the mental health needs do not mirror community ones, the notion of equivalence may need to be reconsidered and prisoners should be compared with individuals in the community with a similar pattern of psychiatric morbidity
- The proportion of funding for mental health services should be at least the proportion of the total health budget that it is in the community
- Social needs of prisoners need to be considered, in addition to health needs
- Prison health should be managed by public health systems, particularly in relation to employment of health care staff, so they act in the best health interests of the prisoners, retain independence from the justice system, and maintain their training and accreditation
- National prison services should have a strategy for their management of health and social needs of older prisoners
- National systems need to be instituted that collect annual information on deaths in prison including by suicide, overcrowding rates, prisoner-prisoner and prisoner-staff assault rates, self-harm rates by gender, availability of methadone maintenance therapy, and research activity (see figure 2 for England and Wales, and country cards for 11 other high-income countries in the appendix)

outlier is the US, where suicide rates in local jails are 41 per 100 000, and 16 per 100 000 prisoners in state prisons.²⁶ One possible explanation is the high proportion of African American and Hispanic prisoners in US institutions, who have lower rates of death by suicide than white prisoners, but even in white prisoners, suicide

rates appear to be lower than in many European countries (80 per 100 000 white prisoners in US local jails and 25 per 100 000 in US state prisons).²⁶

Self-harm is a substantial cause of morbidity but is less studied than suicide. An epidemiological study²⁷ based on 2004–2010 data in English and Welsh prisons found

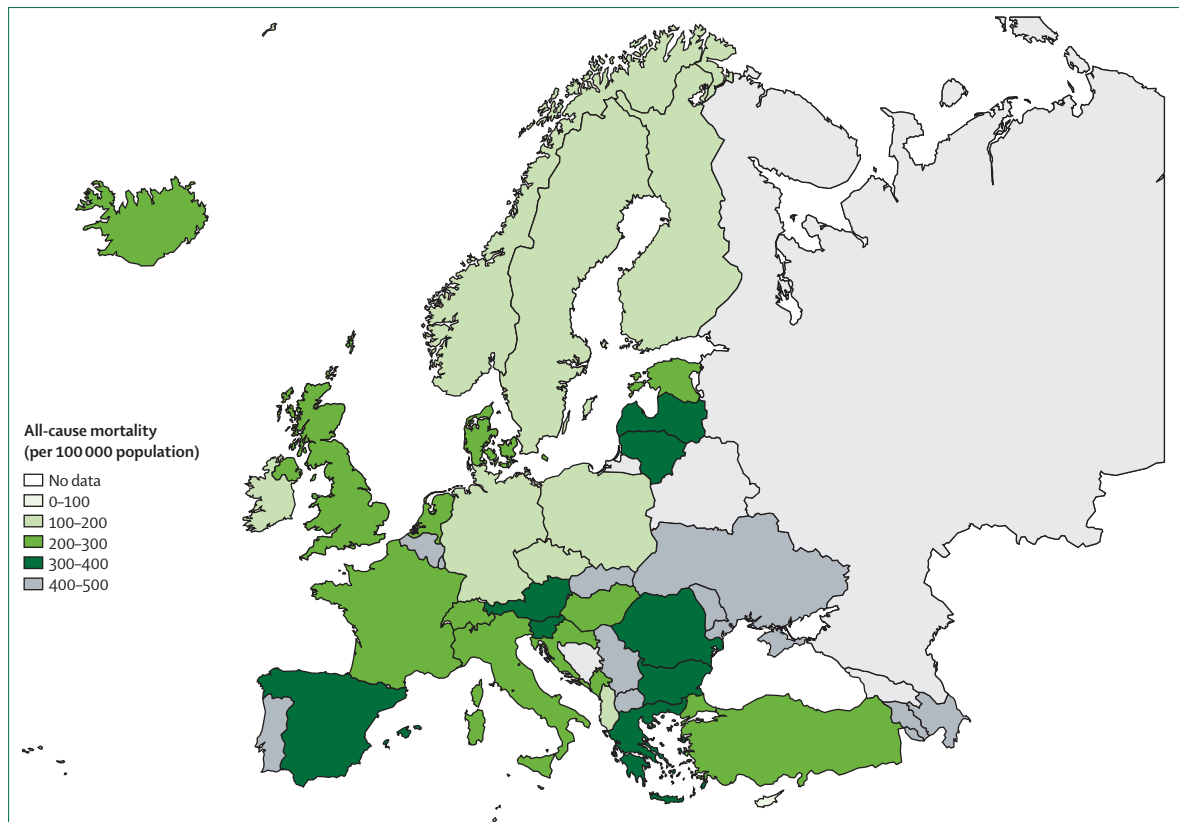


Figure 1: Mean annual all-cause mortality in prison populations in European countries during 2011–13^{23–24}
Rates are per 100 000 people.

that in the previous 12 months in custody, 5–6% of men and 20–24% of women self-harmed. Risk factors include younger age and short sentences, and self-harm seems to cluster in particular prison settings. Table 2 summarises risk factors for suicide, near-lethal self-harm, and self-harm. Near-lethal self-harm is a valid proxy for completed suicide in prisons, and has advantages over psychological autopsy approaches because it allows for a broader and deeper range of risk factors to be evaluated.²⁸

Many interventions for the management of suicide and self-harm in prison have been reviewed,²⁹ ranging from screening on reception, staff training, treatment, appropriate supervision of at-risk prisoners, and improvements to the safety of the physical environment and social support. Overall, the studies have indicated the importance of adequate screening for suicide risk with comprehensive care planning, which is based on identified risk on arrival to prison. However, this research is difficult to appraise because most studies report many simultaneous changes within a prison system, so independent effects cannot be reliably established. For example in England and Wales, the suicide prevention and management strategy for prisons was amended in 2004 to improve identification and risk assessment,³⁰ and prison suicide rates subsequently reduced between 2004 and 2006, although rates have increased since 2012.^{31,32} Screening

tools to identify prisoners at risk of suicide and self-harm were reviewed in 2010.³³ Sensitivity and specificity varied widely between tools, but because none of the studies were prospective, limited conclusions can be drawn and more research is needed on screening tools that have high specificities (panel). Another recommended intervention is suicide risk assessment and management training for staff, often focusing on communication skills. Evaluations of training programmes have not been sufficiently robust to show an effect on suicide outcomes, but have reported that these approaches are acceptable to staff.²⁹

Guidelines for suicide prevention recommend early screening of prisoners at first reception to custody, actions to be taken in response to positive screening, and to monitor ongoing risk.³⁴ Multidisciplinary information sharing and decision-making are emphasised along with appropriate mental health treatment (panel). Finally, suicide prevention guidelines recommend staff training and maintaining a safe environment (eg, removal of potential risks such as ligature suspension points).

Violence and victimisation

Other adverse outcomes associated with psychiatric disorders are violence and victimisation within prison. While violence is common in many prisons, little research exists on its prevalence. Some studies have estimated the

rates of physical assault are 13–27-times higher in prisons than they are in the general population.^{35,36} Non-lethal prisoner-on-prisoner physical assault is the most frequently seen form of violence in prison, although homicides are reported.³⁷ A study³⁵ of 7528 male US prisoners found a 6-month prevalence of 205 per 1000 for inmate-on-inmate physical violence and 246 per 1000 for staff-on-inmate physical violence. US official statistics suggest that the rate of violent assaults on prison staff (155 per 1000 people) is more than double that of violent assaults on staff in non-prison settings.³⁸ UK data for 2015 showed that per 1000 prisoners, 198 incidents of assault on a prisoner occurred, as did 46 incidents of assault on staff.³¹ Again, methodological problems mean that exact figures should be interpreted with caution; official statistics underestimate violence prevalence and base rates of violence can vary owing to differences in violence definition and measurement.

Research aimed at understanding violence within prisons has investigated individual pre-incarceration characteristics and contextual factors. A meta-analysis³⁹ of 90 studies (published between 1996 and 2012) of institutional infractions found that strong contextual predictors of infractions were high levels of gang activity, large prison populations, and a high security level of the institution or proportion of high-security inmates. By contrast, modestly reduced infraction rates were found in settings with an increased level of employment inside prison. The strongest socio-demographic predictor of prison misconduct was a younger age, whereas being black, unmarried, and having a low education level were weaker correlates. In terms of criminological characteristics, the presence of previous infractions was the strongest predictor, while conviction for a violent offence was not a significant predictor.³⁹ Early deviant behaviours (ie, a more extensive criminal history, a younger age when first arrested, and previous incarcerations) have also been associated with behavioural difficulties while incarcerated. Finally, clinical variables such as aggressiveness, impulsiveness, antisocial traits, and psychopathy are robust predictors of institutional infractions.^{40,41}

Prisoners with mental health disorders are disproportionately involved in prison infractions and violent incidents,^{41,42} and are more likely to be charged with violating prison rules than are other prisoners, and twice as likely to be injured in a fight.⁴³ Mentally disordered offenders with a history of violence are at even greater risk of rule-breaking or injury.⁴⁴

Official estimates are likely to under-represent the extent of victimisation in prisons because of sociocultural disincentives to reporting and a particular reluctance of prisoners to report staff victimisation.⁴⁵ Prisoners who have characteristics that make them more probable victims of physical assault (eg, transgender, intellectual disability) can be systematically overrepresented or under-represented, while victimisation by staff might be under-reported. Physical violence is only one form of

victimisation and should be considered alongside property theft, emotional and psychological victimisation, intimidation, and sexual victimisation.

Psychiatric disorders seem to be associated with violence and victimisation outcomes in prison (table 2). This theory is corroborated by a large US regional survey of state prisons with a total of 7528 individuals, where one in 12 male prisoners with a mental disorder reported at least one incident of sexual victimisation by another prisoner over a 6-month period, compared with one in 33 male prisoners without a mental disorder. Among prisoners with mental disorder, sexual victimisation was 3-times higher in female prisoners (23%) than male prisoners (8%).⁵³ Mental disorder also increased risks of physical victimisation. Men in prison with any mental disorder were more likely to be physically victimised (1.6 times for prisoner-on-prisoner and 1.2 times for staff-on-prisoner) higher than men with no mental disorder. Female prisoners with mental disorder were 1.7 times more likely to report being physically victimised by another prisoner than their peers without mental disorders.⁴⁴

In summary, we have shown that individuals with a mental disorder in prison are at increased risk of a

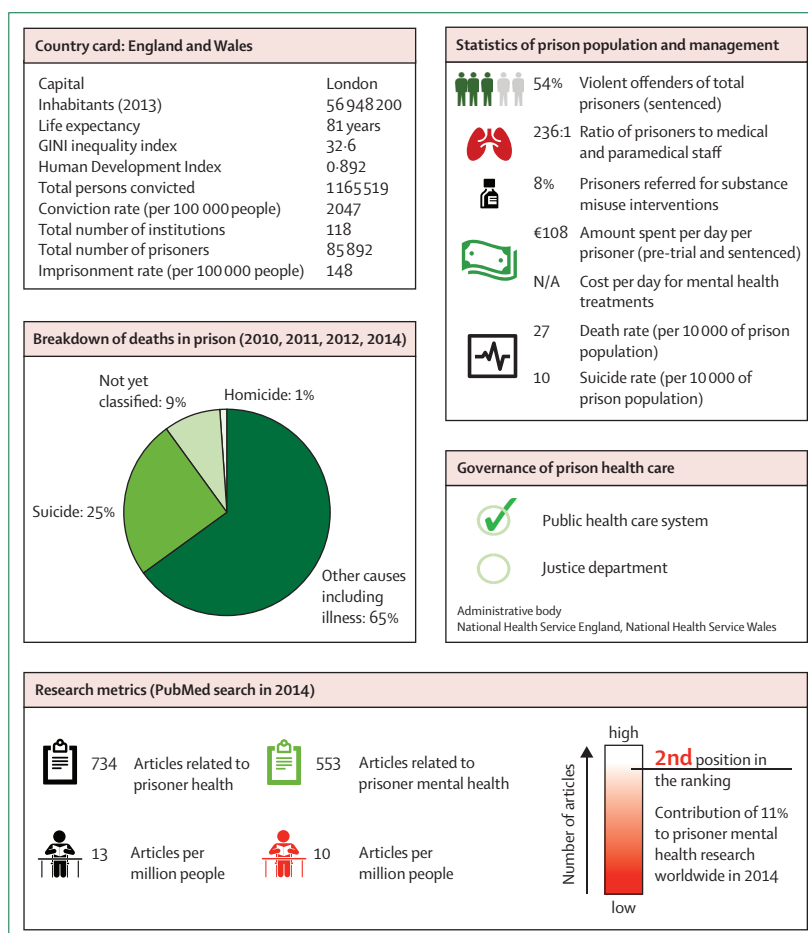


Figure 2: Country card outlining selected prison metrics for England and Wales in 2014

	Risk factors	Protective factors
Suicide ⁴⁶	Suicidal ideation; single cell occupancy; history of attempted suicide; current psychiatric diagnosis; psychotropic medication; detainee or remand status; life sentence; murder or manslaughter offence; violent offence; alcohol use problems; past contact with mental health services ⁴⁷ ; being married before prison	Black race/ethnicity; length of sentence <18 months; sentenced compared with remand
Near-lethal self-harm ^{9,48}	White ethnicity; no educational qualifications; prior prison spell; <30 days in prison; mood disorders; anxiety disorders; psychoses; drug use disorder; past psychiatric treatment; previous self-harm in prison; previous self-harm outside prison; two or more psychiatric disorders	Educational qualifications; contact with family/friends in past 3 months; visits from or speaking with family/friends last 7 days
Self-harm ⁷⁷	Younger age; white ethnicity; sentence length <12 months; life sentence; detainee or remand status; previous violent offence (women only)	Black or Asian or Mixed race/ethnicity; residing in less secure or open prisons
Prison violence ⁴¹	Younger age; minority ethnic group; less formal education; shorter sentence; gang affiliation; prior arrests; prior incarceration; prior poor incarceration adjustment; aggression; psychopathology; less social support; major mental illness; psychopathy; dual diagnosis (mental illness and substance misuse; substance misuse)	Older age
Physical victimisation ^{35,49-52}	Mental disorder; younger age; white ethnicity; sexual offence; past victimisation; gang involvement; dissatisfaction with officers	Involvement in work programmes
Sexual victimisation ⁵³	Mental disorder; female; minority ethnic group	None reported

Table 2: Risk factors for suicide, near-lethal self-harm, self-harm, violence, and victimisation in prisoners

confluence of adverse outcomes compared to people in prison who do not suffer from mental disorders. These negative outcomes include self-harm, suicide, violence and victimisation. Although individual mental disorders do not seem specifically associated with particular poor outcomes, mental illness and substance misuse are risk factors that are linked to all poor outcomes. But without further clarification of modifiable risk factors, development of effective interventions will be limited. Environmental risk factors need to be considered—such as staffing, overcrowding, policies, and the extent and nature of daytime activities—alongside individual-level factors.

Interventions

Mental illness

Many interventions aimed at prisoner mental health have been evaluated, although mostly on a small scale. The small sample size and heterogeneity of prisoners and settings makes synthesis of the research difficult. The lack of research conducted in prisons compared with community settings is secondary to organisational difficulties that exist (such as obtaining permissions and running interventions alongside mandated programmes), a lack of specific research funding, and a perceived division of prisoner health from public health in general (panel).

The number of medication trials conducted in prisons is particularly low. Some small randomised controlled trials (RCTs) have found evidence for attention-deficit hyperactivity disorder medications in Swedish prisoners, including improved global functioning⁵⁴ and increased likelihood of abstinence from amphetamine after release (as measured by negative urine samples).⁵⁵ Another study⁵⁶ found that in women with bipolar disorder, following an evidence-based pharmacological treatment algorithm was no better than treatment as usual (in which medication decisions were taken by the treating clinician) to reduce symptoms and improve medication adherence. More psychopharmacology research in prison settings is required, particularly for commonly prescribed psychotropic medications (panel).

Our review found that there were many more controlled trials of psychological treatments than medication in the prison setting. Psychological therapy trials were typically small, involved a wide variety of interventions (eg, cognitive behavioural, interpersonal, dialectical behavioural, meditation-based, and group therapies), and showed inconsistent findings. One study⁵⁷ of yoga in 167 prisoners, showed that participants randomised to yoga had lower self-rated psychological distress and improved cognitive performance than did controls who kept an exercise diary. In another study,⁵⁸ 120 Iranian prisoners were randomised to receive individual cognitive behavioural therapy, combined individual and group cognitive behavioural therapy, or placed on a waiting list. The study reported improvements in psychological well-being symptom scores for the prisoners who received combined therapy compared with those placed on a waiting list. Another study⁵⁹ included 63 prisoners who received a modified form of dialectical behavioural therapy and were then randomised to receive 8 weeks of further dialectical behavioural therapy or case management. Prisoners who received further dialectical behavioural therapy showed a reduction in psychopathological symptoms at 6 months compared with the case management group, but not at 12 months.

In summary, some evidence supports these psychological interventions, but their effect sizes are not large, and whether the evidence would hold in higher quality designs is uncertain (eg, using active controls and not waiting list or treatment as usual controls), as is whether any improvements are sustained. Although further psychological treatment trials that involve female prisoners and individuals with substance misuse are underway, high quality large trials are lacking. Thus, the effectiveness of commonly used psychological interventions to treat mental health problems needs further clarification in the prison population (panel). The prison environment, in particular the increased structures, different rules, housing, and access to drugs, creates unique challenges, which could explain why psychological

treatments do not work well in prison as compared with in the community. Research on tailored interventions for prisoners, particularly for substance misuse, is required.

Substance misuse

Research into prisoners with substance misuse includes trials of pharmacological and psychological interventions. Differences in study design, sample size, and various heterogeneous outcome measures make synthesis of the data difficult. Nevertheless, we can provide some principles of treatment.

Alcohol and opiates are the two most common and problematic substances for detoxification management in prisons, although provision of such treatment services is variable. One survey found that only 34% of US jails offer any detoxification treatment⁶⁰ equating to about 1 million arrestees annually being at risk of untreated withdrawal from alcohol, including delirium tremens and its associated high mortality.⁶¹ A 2010 Cochrane review⁶² summarised evidence from 64 RCTs in community settings, and found that benzodiazepines are effective against alcohol withdrawal seizures compared with placebo, and are protective for many outcomes compared with alternative drugs.

The management of opiate withdrawal in prison is generally symptomatic, and mostly based on detoxification rather than maintenance. A 2013 systematic review⁶³ identified 23 controlled trials with 2467 adult opioid users, which included samples with criminal histories. Participants were randomised to receive methadone or another pharmacological agent, and the evidence showed that slow tapering with long-acting opioids reduced withdrawal severity, although relapse was common.⁶³ One controlled trial included in the 2013 review is the Leeds Evaluation of Efficacy of Detoxification Study (LEEDS), an open-label RCT of 306 prisoners in three English prisons. LEEDS compared methadone with buprenorphine detoxification and found equivalent clinical effectiveness. A further RCT from this group compared dihydrocodeine with buprenorphine and showed comparable effectiveness for acute opiate detoxification.⁶⁴ On the basis of this evidence, all prisoners at risk of drug or alcohol withdrawal should be offered acute detoxification on arrival (panel).

Psychological treatments for substance misuse include attendance at therapeutic communities, cognitive behavioural therapy, and motivational interviewing. A meta-analysis of prison-based therapeutic communities suggested that participation increases treatment success, and that relapse and re-incarceration were most effectively reduced in individuals in therapeutic communities who received aftercare in the community.⁶⁵ A meta-analysis of moral reconnection therapy, which focuses on moral reasoning and was originally a component of therapeutic communities, supported the notion that moral reconnection therapy reduced recidivism.⁶⁶

Various cognitive behavioural therapy-based interventions studied in prison populations with substance misuse show effectiveness compared with drug and

alcohol education or no treatment. However, design limitations prevent clear generalizability, and study outcomes generally focus on rate of re-incarceration as a proxy for relapse.⁶⁶ A review⁶⁷ on Reasoning and Rehabilitation, a 35-session cognitive behavioural therapy programme that focuses on prosocial attitudes, emotion regulation and self-control, and interpersonal problem solving, showed that its use reduced recidivism.

Motivational interviewing is regarded as an evidence-based treatment, particularly for alcohol misuse. One RCT⁶⁸ of adolescents incarcerated for driving while intoxicated found lower rates of re-offence with motivational interviewing than their control group who received relaxation training.

Apart from psychological treatments, good evidence supports the treatment of opiate and alcohol misuse with medication-assisted therapy, which combines pharmacological treatments (including methadone, buprenorphine and naltrexone) and psychological approaches. A recent extensive literature search of treatments for drug-abusing offenders found 15 methodologically rigorous evaluations from six European countries, containing 3953 participants: reoffending ($d=0.47$) and drug use ($d=0.38$) were significantly reduced with medication-assisted therapy where control groups were either no treatment or methadone-assisted treatment.⁶⁹ In a Cochrane review⁷⁰ of pharmacological interventions in offenders with substance misuse, 11 studies met criteria for inclusion; the overall results reflected that medication-assisted therapy reduced drug use in this population.

Methadone maintenance therapy has been implemented in many countries. A Cochrane review⁷¹ in all settings showed that methadone maintenance therapy decreases heroin use and enhances treatment retention compared with non-pharmacological treatments.

Starting methadone before release is significantly more effective for treatment retention, reduced drug use, and reduced reoffending than is either counselling alone or simple referral to methadone maintenance therapy upon release.^{72,73} A RCT⁷⁴ conducted at a US prison compared methadone maintenance therapy plus counselling, counselling and community referral, and counselling alone for 204 individuals; those individuals who received methadone maintenance therapy showed increased post-release treatment retention and decreased drug abuse and the benefits persisted at 6 months and 12 months post-release. Another RCT⁷⁵ compared methadone maintenance therapy with monitored withdrawal and found that return to treatment in the community upon release was more common in the methadone maintenance therapy sample.

Many programme evaluations have shown opiate use reduced after release when individuals were started on methadone during incarceration. A RCT⁷⁶ conducted in New York City (NY, USA) compared methadone maintenance therapy with buprenorphine and found equivalence in self-reported relapse, but superiority for buprenorphine-treated patients for post-release treatment

engagement. Another RCT⁷⁷ with 211 offenders compared buprenorphine treatment with counselling initiated pre-release, and the results showed community treatment entry was increased for offenders randomised to buprenorphine. Some RCT evidence supports the use of intramuscular naltrexone as an alternative to methadone.⁷⁸

In summary, the evidence supports the use of methadone maintenance therapy in the criminal justice population, and further research with intramuscular naltrexone and oral buprenorphine is warranted. Additionally, there is a relative paucity of studies on alcohol misuse treatment in prisoners. Nevertheless, on the basis of evidence we have reviewed, opiate substitution and cognitive behavioural therapy-based relapse prevention therapies should be made available to all prisoners (panel).

Specific populations

Women in prison

Most prisons across the world are separated by gender, and research has shown that the demographic, health, and criminal characteristics of female prisoners are different from males. In this section, we review some female-specific areas of prison research.

Some trauma-focused interventions for female prisoners have been developed. However, most trials have been small and reported non-significant findings, which may represent inadequate power. Seeking Safety, a trauma-focused CBT intervention that involved 18–24 group sessions inside prison with 12 additional sessions post-release, did not show improved outcomes compared with treatment as usual (ie, 180–240 h of individual and group treatment).⁷⁹ Another RCT⁸⁰ compared trauma affect regulation with supportive group therapy and identified no difference in recovery between groups. Despite disappointing results to date, larger studies are needed to fully evaluate the efficacy of trauma-focused therapies (see Research recommendations, panel). RCTs for other interventions amongst women prisoners are lacking, including mindfulness and cognitive behavioural and dialectical behavioural therapies.

Additionally, a small number of studies have focused on psychiatric morbidity in prisoners at specialised mother and baby units as discussed in a 2014 review.⁸¹

Older adults in prison

The number and proportion of older adults in prison is rising in high-income countries. In several countries (eg, England and Wales, USA, Australia and Japan), prisoners aged 60 years and older are now the fastest-growing age group, and the number is expected to continue to rise as the population ages. Much of the research on older prisoners has described their demographic, criminal, and health characteristics,^{82,83} supplemented with newer research on health, social, and custodial needs.⁸⁴ Very few intervention studies have been done in older people, despite their increased chronic physical health problems, depression, and functional ability. These research gaps have been reviewed elsewhere.⁸³

Recommendations

On the basis of this review, we have outlined a number of recommendations relevant to clinical practice and research (panel). Policy recommendations are also included that incorporate recommendations from WHO.¹⁸ Relevant to these recommendations is surveillance of key indicators on a regular basis. We have suggested a format for the presentation of these key indicators for England and Wales (figure 2) and for 13 other western European, North American, and Australasian countries (appendix) which would allow comparison between different countries, including the extent of prison-based health research. The choice of these countries was determined by those with populations of more than 5 million and in the top half of GDPs (US\$35 000 per head according to the World Bank 2011–14).

Conclusions

Mental disorders are over-represented in prisoners. The strongest evidence is for serious mental disorders, where surveys estimate that around one in seven prisoners are diagnosed with psychosis or depression. Substance abuse is also greatly increased in prisoners, compared with the general population, with around one in five entering prison with substance misuse.² For many other disorders, the picture is complicated by self-reported approaches to diagnosis that may overestimate rates, and meta-analyses relying on random-effects models that weigh small studies similarly to larger higher quality investigations. Further research should move beyond simple prevalence studies and examine the contribution of prison to these excess rates, and the extent, consequences, and patterns of novel psychoactive substance use. Individuals in prison with mental health problems are at increased risk of suicide, self-harm, violence, and victimisation. Risk factors for these outcomes are not specific and few of these factors are shared across them, limiting development of effective interventions. Thus, interventions will mostly have to rely on evidence from non-prison settings, although some prison-specific research has suggested that the pharmacological treatment of attention-deficit hyperactivity disorder, and cognitive

See Online for appendix

Search strategy and selection criteria

We searched PubMed and Web of Knowledge for articles published between Jan 1, 2003 and Dec 31, 2015. Search terms included (prison* or jail* or offender* or criminal* or inmate* or correction* or penitentiary*) and (RCT* or trial* or randomi* or control*) for intervention studies supplemented with searches based on (mental* or psychiatr* or drug* or alcohol or substance*) for prevalence and interventions, with (suicid* or [self and (harm* or injur* or inflict*)] and (violen* or infraction* or assault* or victim* or bullying or bullie*) for adverse outcomes. Searches also included citations to studies selected for inclusion. We preferentially included recent systematic reviews and meta-analyses, unselected prisoner samples for prevalence research, and RCTs with 50 or more participants for the sections on interventions. Unlike a systematic review, reference lists were not manually checked for all identified papers, nor was a meta-analysis considered.

behavioural therapy-based treatments for depression, could improve outcomes. High quality RCT evidence exists on methadone maintenance and opioid substitution treatments, but little on how to treat alcohol misuse. A number of special groups in prison, including women and older prisoners, appear to have specific mental health needs and may need tailored treatments. Justice departments should collaborate with researchers because concerted action by government, funding agencies, and researchers will be needed to address the scarcity of treatment research.

Contributors

SF and AH completed the literature search. SF drafted the sections on prevalence of psychiatric disorders, suicide risk, and recommendations; MC on violence and victimisation; RT on treatment for substance misuse; and AH on interventions for suicide risk and mental health, and special populations. KB compiled infographic cards. All authors contributed to final manuscript.

Declarations of interest

We declare no competing interests.

References

- Fazel S, Seewald K. Severe mental illness in 33 588 prisoners worldwide: systematic review and meta-regression analysis. *Br J Psychiatry* 2012; **200**: 364–73.
- Fazel S, Bains P, Doll H. Substance abuse and dependence in prisoners: a systematic review. *Addict* 2006; **101**: 181–91.
- Fazel S, Danesh J. Serious mental disorder in 23 000 prisoners: a systematic review of 62 surveys. *Lancet* 2002; **359**: 545–50.
- Young S, Moss D, Sedgwick O, Fridman M, Hodgkins P. A meta-analysis of the prevalence of attention deficit hyperactivity disorder in incarcerated populations. *Psychol Med* 2015; **45**: 247–58.
- Usher AM, Stewart LA, Wilton G. Attention deficit hyperactivity disorder in a Canadian prison population. *Int J Law Psychiatry* 2013; **36**: 311–15.
- Gaiffas A, Galera C, Mandon V, Bouvard MP. Attention-deficit/hyperactivity disorder in young French male prisoners. *J Forensic Sci* 2014; **59**: 1016–19.
- Gunn J, Maden A, Swinton M. Treatment needs of prisoners with psychiatric disorders. *BMJ* 1991; **303**: 338–41.
- Birmingham L, Mason D, Grubin D. Prevalence of mental disorder in remand prisoners: consecutive case study. *BMJ* 1996; **13**: 1521–24.
- Rivlin A, Hawton K, Marzano L, Fazel S. Psychiatric disorders in male prisoners who made near-lethal suicide attempts: case-control study. *Br J Psychiatry* 2010; **197**: 313–19.
- Robinson L, Spencer MD, Thomson LDG, et al. Evaluation of a screening instrument for autism spectrum disorders in prisoners. *PLoS One* 2012; **7**: e36078.
- Senior J, Birmingham L, Harty MA, et al. Identification and management of prisoners with severe psychiatric illness by specialist mental health services. *Psychol Med* 2013; **43**: 1511–20.
- Butler T, Indig D, Allnut S, Mamoon H. Co-occurring mental illness and substance use disorder among Australian prisoners. *Drug Alcohol Rev* 2011; **30**: 188–94.
- Chang Z, Lichtenstein P, Larsson H, Fazel S. Substance use disorders, psychiatric disorders, and mortality after release from prison: a nationwide longitudinal cohort study. *Lancet Psychiatry* 2015; **2**: 422–30.
- Binswanger IA, Merrill JO, Krueger PM, White MC, Booth RE, Elmore JG. Gender differences in chronic medical, psychiatric, and substance-dependence disorders among jail inmates. *Am J Public Health* 2010; **100**: 476–82.
- HM Chief Inspector of Prisons for England and Wales. Annual Report 2014–15. London, 2015. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/444785/hmip-2014-15.pdf (accessed Nov 11, 2015).
- Fazel S, Wolf A, Palm C, Lichtenstein P. Violent crime, suicide, and premature mortality in patients with schizophrenia and related disorders: a 38-year total population study in Sweden. *Lancet Psychiatry* 2014; **1**: 44–54.
- Fazel S, Wolf A, Chang Z, Larsson H, Goodwin GM, Lichtenstein P. Depression and violence: a Swedish population study. *Lancet Psychiatry* 2015; **2**: 224–32.
- Enggist S, Möller L, Galea G, Udesen C. Prisons and Health. Copenhagen: World Health Organisation; 2014. http://www.euro.who.int/_data/assets/pdf_file/0005/249188/Prisons-and-Health.pdf Accessed Nov 11, 2015.
- Hassan L, Birmingham L, Harty MA, et al. Prospective cohort study of mental health during imprisonment. *Br J Psychiatry* 2011; **198**: 37–42.
- Australian Institute of Health and Welfare. The health of Australia's prisoners. Canberra: Australian Institute of Health and Welfare, 2015.
- Fazel S, Grann M, Kling B, Hawton K. Prison suicide in 12 countries: an ecological study of 861 suicides during 2003–2007. *Soc Psychiatry Psychiatr Epidemiol* 2011; **46**: 191–95.
- Aebi MF, Delgrande N. SPACE I – Council of Europe annual penal statistics: prison populations. Survey 2011. Strasbourg: Council of Europe, 2013.
- Aebi MF, Delgrande N. SPACE I – Council of Europe annual penal statistics: prison populations. Survey 2012. Strasbourg: Council of Europe, 2014.
- Aebi MF, Delgrande N. SPACE I – Council of Europe annual penal statistics: prison populations. Survey 2013. Strasbourg: Council of Europe, 2015.
- Duthé G, Hazard A, Kensey A, Pan Ké Shon J-L. Suicide among male prisoners in France: a prospective population-based study. *Forensic Sci Int* 2013; **233**: 273–77.
- Bureau of Justice Statistics. Mortality in local jails and state prisons, 2000–2013—statistical tables. Washington DC: Bureau of Justice Statistics, 2015.
- Hawton K, Linsell L, Adeniji T, Sariaslan A, Fazel S. Self-harm in prisons in England and Wales: an epidemiological study of prevalence, risk factors, clustering, and subsequent suicide. *Lancet* 2014; **383**: 1147–54.
- Rivlin A, Fazel S, Marzano L, Hawton K. Studying survivors of near-lethal suicide attempts as a proxy for completed suicide in prisons. *Forensic Sci Int* 2012; **220**: 19–26.
- Barker E, Kolves K, De Leo D. Management of suicidal and self-harming behaviors in prisons: systematic literature review of evidence-based activities. *Arch Suicide Res* 2014; **18**: 227–40.
- Humber N, Hayes A, Senior J, Fahy T, Shaw J. Identifying, monitoring and managing prisoners at risk of self-harm/suicide in England and Wales. *J Forens Psychiatry Psychol* 2011; **22**: 22–51.
- Ministry of Justice. Safety in custody statistics England and Wales: deaths in prison custody to June 2015. Assaults and self-harm to March 2015. London: Ministry of Justice, 2015. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/449648/safety-in-custody-2015.pdf (accessed Nov 11, 2015).
- Humber N, Piper M, Appleby L, Shaw J. Characteristics of and trends in subgroups of prisoner suicides in England and Wales. *Psychol Med* 2011; **41**: 2275–85.
- Perry AE, Marandos R, Coulton S, Johnson M. Screening tools assessing risk of suicide and self-harm in adult offenders: a systematic review. *Int J Offender Ther Comp Criminol* 2010; **54**: 803–28.
- Konrad N, Daigle MS, Daniel AE, et al. Preventing suicide in prisons, part I - recommendations from the International Association for Suicide Prevention Task Force on Suicide in Prisons. *Crisis* 2007; **28**: 113–21.
- Blitz CL, Wolff N, Shi J. Physical victimization in prison: the role of mental illness. *Int J Law Psychiatry* 2008; **31**: 385–93.
- Teplin LA, McClelland GM, Abram KM, Weiner DA. Crime victimization in adults with severe mental illness—Comparison with the national crime victimization survey. *Arch Gen Psychiat* 2005; **62**: 911–21.
- Stephan JJ, Karberg JC. Census of state and federal correctional facilities 2000 (No. NCJ 198272). Washington, DC: Bureau of Justice Statistics, US Department of Justice, 2003.
- Duhart DT. Violence in the workplace, 1993–99 Washington DC: US Department of Justice, Office of Justice Programs, 2001. <http://www.bjs.gov/content/pub/pdf/csf00.pdf> (accessed Nov 11, 2015).
- Goncalves LC, Goncalves RA, Martins C, Dirkzwager AJE. Predicting infractions and health care utilization in prison: a meta-analysis. *Crim Justice Behav* 2014; **41**: 921–42.

- 40 Campbell MA, French S, Gendreau P. The prediction of violence in adult offenders: a meta-analytic comparison of instruments and methods of assessment. *Crim Justice Behav* 2009; **36**: 567–90.
- 41 Schenk AM, Fremouw WJ. Individual characteristics related to prison violence: a critical review of the literature. *Aggress Violent Behav* 2012; **17**: 430–42.
- 42 Houser KA, Welsh W. Examining the association between co-occurring disorders and seriousness of misconduct by female prison inmates. *Crim Justice Behav* 2014; **41**: 650–66.
- 43 James JD, Glaze LE. Mental health problems of prison and jail inmates (NCJ 213600). Washington, DC: US Department of Justice, Bureau of Justice Statistics, 2006. <http://www.bjs.gov/content/pub/pdf/mhppji.pdf> (accessed Nov 11, 2015).
- 44 Walters GD, Crawford G. Major mental illness and violence history as predictors of institutional misconduct and recidivism: main and interaction effects. *Law Hum Behav* 2014; **38**: 238–47.
- 45 Gilligan J. Violence: Reflections on a national epidemic. New York: Vintage Books, 1997.
- 46 Fazel S, Cartwright J, Norman-Nott A, Hawton K. Suicide in prisoners: a systematic review of risk factors. *J Clin Psychiatry* 2008; **69**: 1721–31.
- 47 Humber N, Webb R, Piper M, Appleby L, Shaw J. A national case-control study of risk factors among prisoners in England and Wales. *Soc Psychiatry Psychiatr Epidemiol* 2013; **48**: 1177–85.
- 48 Rivlin A, Hawton K, Marzano L, Fazel S. Psychosocial characteristics and social networks of suicidal prisoners: towards a model of suicidal behaviour in detention. *PLoS One* 2013; **8**: e68944.
- 49 Wolff N, Shi J. Victimization and feelings of safety among male and female inmates with behavioural health problems. *J Forens Psychiatry Psychol* 2009; **20** (suppl 1): 56–77.
- 50 Huebner BM. Administrative determinants of inmate violence: a multilevel analysis. *J Crim Justice* 2003; **31**: 107–17.
- 51 Wolff N, Shi J, Siegel J. Understanding physical victimization inside prisons: factors that predict risk. *Justice Q* 2009; **26**: 445–75.
- 52 Perez DM, Gover AR, Tennyson KM, Santos SD. Individual and institutional characteristics related to inmate victimization. *Int J Offender Ther Comp Criminol* 2010; **54**: 378–94.
- 53 Blitz CL, Wolff N, Shi J. Rates of sexual victimization in prison for inmates with and without mental disorders. *Psychiatr Serv* 2007; **58**: 1087–94.
- 54 Ginsberg Y, Lindefors N. Methylphenidate treatment of adult male prison inmates with attention-deficit hyperactivity disorder: randomised double-blind placebo-controlled trial with open-label extension. *Br J Psychiatry* 2012; **200**: 68–73.
- 55 Konstenius M, Jayaram-Lindstroem N, Guterstam J, Beck O, Philips B, Franck J. Methylphenidate for attention deficit hyperactivity disorder and drug relapse in criminal offenders with substance dependence: a 24-week randomized placebo-controlled trial. *Addict* 2014; **109**: 440–49.
- 56 Ehret MJ, Shelton D, Barta W, et al. Medication adherence among female inmates with bipolar disorder: results from a randomized controlled trial. *Psychol Serv* 2013; **10**: 106–14.
- 57 Bilderbeck AC, Farias M, Brazil IA, Jakobowitz S, Wikholm C. Participation in a 10-week course of yoga improves behavioural control and decreases psychological distress in a prison population. *J Psychiatr Res* 2013; **47**: 1438–45.
- 58 Khodayarifard M, Shokoochi-Yekta M, Hamot GE. Effects of individual and group cognitive-behavioral therapy for male prisoners in Iran. *Int J Offender Ther Comp Criminol* 2010; **54**: 743–55.
- 59 Shelton D, Sampl S, Kesten KL, Zhang WL, Trestman RL. Treatment of impulsive aggression in correctional settings. *Behav Sci Law* 2009; **27**: 787–800.
- 60 Oser CB, Knudsen HK, Staton-Tindall M, Taxman F, Leukefeld C. Organizational-level correlates of the provision of detoxification services and medication-based treatments for substance abuse in correctional institutions. *Drug Alcohol Depend* 2009; **103** (suppl 1): S73–81.
- 61 Hasin DS, Stinson FS, Ogburn E, Grant BF. Prevalence, correlates, disability, and comorbidity of DSM-IV alcohol abuse and dependence in the United States—results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Arch Gen Psychiatry* 2007; **64**: 830–42.
- 62 Amato L, Minozzi S, Vecchi S, Davoli M. Benzodiazepines for alcohol withdrawal. *Cochrane Database Syst Rev* 2010; **3**: CD005063.
- 63 Amato L, Davoli M, Minozzi S, Ferroni E, Ali R, Ferri M. Methadone at tapered doses for the management of opioid withdrawal. *Cochrane Database Syst Rev* 2013; **2**: CD003409.
- 64 Sheard L, Wright NMJ, El-Sayeh HG, Adams CE, Li R, Tompkins CNE. The Leeds Evaluation of Efficacy of Detoxification Study (LEEDS) prisons project: a randomised controlled trial comparing dihydrocodeine and buprenorphine for opiate detoxification. *Subst Abuse Treat Prev Policy* 2009; **4**: 1.
- 65 Mitchell O, Wilson DB, MacKenzie DL. Does incarceration-based drug treatment reduce recidivism? A meta-analytic synthesis of the research. *J Exp Criminol* 2007; **3**: 353–75.
- 66 Ferguson LM, Wormith JS. A meta-analysis of moral reparation therapy. *Int J Offender Ther Comp Criminol* 2013; **57**: 1076–106.
- 67 Tong LSJ, Farrington DP. How effective is the "Reasoning and Rehabilitation" programme in reducing reoffending? A meta-analysis of evaluations in four countries. *Psychol Crime Law* 2006; **12**: 3–24.
- 68 Stein LAR, Colby SM, Barnett NP, Monti PM, Golembeske C, Lebeau-Craven R. Effects of motivational interviewing for incarcerated adolescents on driving under the influence after release. *Am J Addict* 2006; **15**: 50–57.
- 69 Koehler JA, Humphreys DK, Akoensi TD, de Ribera OS, Loesel F. A systematic review and meta-analysis on the effects of European drug treatment programmes on reoffending. *Psychol Crime Law* 2014; **20**: 584–602.
- 70 Perry AE, Neilson M, Martyn-St James M, et al. Pharmacological interventions for drug-using offenders. *Cochrane Database Syst Rev* 2013; **12**: CD010862.
- 71 Mattick RP, Breen C, Kimber J, Davoli M. Methadone maintenance therapy versus no opioid replacement therapy for opioid dependence. *Cochrane Database Syst Rev* 2009; **3**: CD002209.
- 72 Gordon MS, Kinlock TW, Schwartz RP, O'Grady KE. A randomized clinical trial of methadone maintenance for prisoners: findings at 6 months post-release. *Addict* 2008; **103**: 1333–42.
- 73 McKenzie M, Zaller N, Dickman SL, et al. A randomized trial of methadone initiation prior to release from incarceration. *Subst Abuse* 2012; **33**: 19–29.
- 74 Kinlock TW, Gordon MS, Schwartz RP, Fitzgerald TT, O'Grady KE. A randomized clinical trial of methadone maintenance for prisoners: results at 12 months postrelease. *J Subst Abuse Treat* 2009; **37**: 277–85.
- 75 Rich JD, McKenzie M, Larney S, et al. Methadone continuation versus forced withdrawal on incarceration in a combined US prison and jail: a randomised, open-label trial. *Lancet* 2015; **386**: 350–59.
- 76 Magura S, Lee JD, Hersherberger J, et al. Buprenorphine and methadone maintenance in jail and post-release: a randomized clinical trial. *Drug Alcohol Depend* 2009; **99**: 222–30.
- 77 Gordon MS, Kinlock TW, Schwartz RP, Fitzgerald TT, O'Grady KE, Vocci FJ. A randomized controlled trial of prison-initiated buprenorphine: prison outcomes and community treatment entry. *Drug Alcohol Depend* 2014; **142**: 33–40.
- 78 Lobmaier PP, Kunoe N, Gossop M, Katevold T, Waal H. Naltrexone implants compared to methadone: outcomes six months after prison release. *Eur Addict Res* 2010; **16**: 139–45.
- 79 Zlotnick C, Johnson J, Najavits LM. Randomized controlled pilot study of Cognitive-Behavioral Therapy in a sample of incarcerated women with substance use disorder and PTSD. *Behav Ther* 2009; **40**: 325–36.
- 80 Ford JD, Chang R, Levine J, Zhang W. Randomized clinical trial comparing affect regulation and supportive group therapies for victimization-related PTSD with incarcerated women. *Behav Ther* 2013; **44**: 262–76.
- 81 Mukherjee S, Pierre-Victor D, Bahelah R, Madhivanan P. Mental health issues among pregnant women in correctional facilities: a systematic review. *Women Health* 2014; **54**: 816–42.
- 82 Fazel S, Hope T, O'Donnell I, Piper M, Jacoby R. Health of elderly male prisoners: worse than the general population, worse than younger prisoners. *Age Ageing* 2001; **30**: 403–07.
- 83 Ginn S. Elderly prisoners. *BMJ* 2012; **345**: e6263.
- 84 Hayes AJ, Burns A, Turnbull P, Shaw JJ. The health and social needs of older male prisoners. *Int J Geriatr Psychiatry* 2012; **27**: 1155–62.