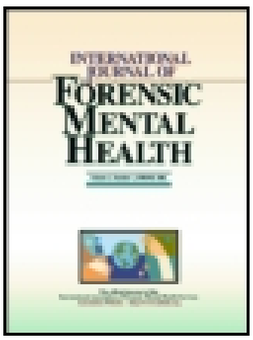

International Journal of Forensic Mental Health

ISSN: 1499-9013 (Print) 1932-9903 (Online) Journal homepage: https://www.tandfonline.com/loi/ufmh20

Prevalence of Mental Disorders and Symptoms Among Incarcerated Youth: A Meta-Analysis of 30 Studies

Maria Livanou, Vivek Furtado, Catherine Winsper, Annabelle Silvester & Swaran P. Singh

To cite this article: Maria Livanou, Vivek Furtado, Catherine Winsper, Annabelle Silvester & Swaran P. Singh (2019): Prevalence of Mental Disorders and Symptoms Among Incarcerated Youth: A Meta-Analysis of 30 Studies, International Journal of Forensic Mental Health, DOI: 10.1080/14999013.2019.1619636

To link to this article: https://doi.org/10.1080/14999013.2019.1619636

Published online: 07 Jun 2019.

INTERNATIONAL JOURNAL OF FORENSIC MENTAL HEALTH
https://doi.org/10.1080/14999013.2019.1619636

Prevalence of Mental Disorders and Symptoms Among Incarcerated Youth: A Meta-Analysis of 30 Studies

Maria Livanou[a], Vivek Furtado[b,c], Catherine Winsper[b], Annabelle Silvester[d], and Swaran P. Singh[b,e]

[a]Department of Psychology, School of Law, Social and Behavioural Sciences, Kingston University, London, UK; [b]School, Mental Health and Wellbeing, Division of Health Sciences, Coventry, UK; [c]Birmingham and Solihull Mental Health Foundation Trust, Birmingham, UK; [d]Psychological Wellbeing Practitioner, University of Leicester, Leicester, UK; [e]Coventry and Warwickshire Partnership Trust, Coventry, UK

ABSTRACT

Incarcerated youth have high levels of mental disorders. However, there are no up-to-date reviews examining the prevalence rates of a broad range of mental disorders and symptoms across youth justice populations. The current review aims to bridge this gap. We conducted a systematic search of the literature using PsycINFO, Medline, Embase, and Web of Science databases. We used meta-analyses to produce pooled prevalence figures for each mental health disorder and symptoms, and meta-regression to test for the moderating effects of covariates, such as gender. Thirty studies were included involving 8,153 participants. Meta-regression analysis showed that females had higher prevalence rates for depression, separation anxiety disorder and suicide. Males had higher prevalence rates for conduct disorder and emerging antisocial personality disorder. Emerging personality disorders (borderline personality disorder: 21%; 95% CI: 13–28%; antisocial personality disorder: 62%; 95% CI: 39–82%) were relatively common in both genders. The findings of this meta-analysis show the need for robust mental health services in custody settings. Adopting a developmentally focused approach would increase understanding of incarcerated youths' needs and help to early detection of emerging personality symptoms. To improve young people's mental health, we need to ensure that services do not misidentify young people's needs due to diagnostic limitations.

KEYWORDS

incarcerated youth; mental disorders; pooled prevalence; emerging personality disorders

Introduction

Incarcerated youth are three times more likely to have a mental disorder than young people in the general population (Prison Reform Trust, 2012). According to a UK national study, 95% of incarcerated youth between 16 and 20 years had at least one mental disorder, while nearly 80% had comorbid mental health difficulties (Lader, Singleton, & Meltzer, 2003). International studies also demonstrate a high prevalence of mental health problems in this group (Colins et al., 2010; Gretton & Clift, 2011; Indig et al., 2009; Zhou et al., 2012).

Previous reviews have reported a high prevalence of mental disorders and symptoms among youth in custody, although they have focused on a narrow range of diagnosed mental disorders (Colins et al. 2010; Fazel, Doll, & Långström, 2008). Fazel and colleagues (2008) conducted a meta-analysis of the pooled prevalence of some mental disorders including major depression, psychotic illness, conduct disorder, and attention deficit hyperactivity disorder (ADHD) in juvenile detention and correctional facilities and found significantly higher rates for conduct disorder and psychotic illness among incarcerated youth than the general population. Colins et al. (2010) considered a wider range of mental disorders such as oppositional defiant disorder (ODD), post-traumatic stress disorder (PTSD), separation anxiety disorder (SAD) in male samples only, but again did not examine learning disabilities (LDs), emerging personality disorders (PDs), and self-harm or past suicide attempts. Colins et al. (2010) reported similar prevalence rates for conduct disorder and ADHD rates to Fazel's review. However, psychotic illness was less prevalent. Additionally, Colins reported higher prevalence rates for PTSD and SAD.

PDs are highly prevalent in adult-justice populations (Fazel & Danesh, 2002; Joseph & Benefield, 2012) and there is growing awareness of the clinical

CONTACT Maria Livanou m.livanou@kingston.ac.uk Department of Psychology, School of Law, Social and Behavioural Sciences, Kingston University, Kingston Upon Thames, London, Surrey KT1 2EE, UK.

importance of PDs, and associated symptoms, such as self-harm and suicide attempts in younger populations (Shiner & Allen, 2013; Winsper et al., 2015, 2016). However, the clinical diagnosis of PDs in adolescents is quite controversial. An increasing number of studies suggest that clinical symptoms of borderline personality disorder (BPD) manifest during adolescent years (Kaszynski et al., 2014). A recent study among females in a UK forensic inpatient unit, revealed that emerging BPD was prevalent among two thirds of the sample (Hill et al., 2014). Therefore, it is clinically important to identify emerging PDs during such a key developmental period as adolescence and the potential link to risk-taking or violent behavior.

It is critical to consider suicide for youth in custody given high demonstrated rates. Suicides in custody among youth 15–19 years remains a concerning issue since 21.9 per 100,000 young individuals will die due to suicide that is 3 times higher than the general population (Gallagher & Dobrin, 2006). Research has shown that youth with additional diagnosed mental health psychopathology and incarcerated female youth are at increased risk for suicide (Abram et al., 2008; Hill, Argent, Lolley, & Wallington, 2016).

Previous studies have identified LDs among incarcerated youth as a major concern (Chitsabesan & Bailey, 2006; Hughes et al., 2017; Loucks, 2007).

LDs among youth in custody are quite common, with between 23 and 32% of incarcerated youth having a generalized learning disability compared to 2–4% in the general population (Hughes, 2012). A large study including 301 justice-involved youth from secure settings and the community reported that about a quarter, had LDs identified with IQ scores below 70 and a third had borderline scores varying between 70 and 80 (Harrington et al., 2005). LDs and ADHD have been associated with higher risk of offending (Penner, Roesch, & Viljoen, 2011). Poor educational history, such as early drop-out from school, is linked to LDs, delinquent peers and early criminal behavior (Einat & Einat, 2008). However, we need more empirical evidence to corroborate a profound relationship between LDs and offending.

To increase our understanding of mental health needs and complex psychopathology among incarcerated youth, we should also consider a broad spectrum of mental health disorders, problems, difficulties and associated symptoms. To the best of our knowledge, this is the first review to compute pooled prevalence rates of self-harm, past suicide attempts, emerging PDs and LDs in this population.

If we are to meet young people's needs and ensure recovery, reduce recidivism, and promote functional independence, then we need to provide adequate care. Therefore, we need to understand the nature and magnitude of their needs. Hence, it is necessary to examine diagnosed mental disorders, emerging mental disorders, symptoms, and LDs along with more commonly studied and diagnosed mental disorders.

Potential moderators of prevalence figures

When considering the prevalence of mental disorders and symptoms within justice-involved youth, it is important to consider potential moderators, which may impact on figures. The prevalence of mental disorders can vary depending on age. Age relativity might be significant when diagnosing a mental disorder. This is the case of antisocial personality disorder, where diagnostic symptoms in adulthood are common in typical adolescent development (Grisso, 2004). Further, mental health psychopathology manifests into different symptoms across the lifespan. For instance, depression in youth presents with aggression (Grisso, 2008). Previous studies have reported that younger individuals in the justice system are more prone to disruptive behavior disorders, such as conduct disorder (Karnik et al., 2010). This could be pertinent to being in contact with the youth justice system from a younger age and presenting with more serious psychopathology.

Gender differences in prevalence rates have been mentioned in the literature across community and custody samples. Fazel et al. (2008) in his review reported gender variations too. According to the study's findings, major depression was prevalent in 29% females and 11% males, ADHD in 19% females and 12% males while there were only slight gender differences in conduct disorder and psychosis. Overall, there are not enough studies including female justice-involved youth in the literature and there are fewer studies on juvenile female psychopathology than on incarcerated male youth, as a much smaller number of incarcerated females exists (Dixon, Howie, & Starling, 2004).

Aims of the study

The main aim of the study was to calculate pooled prevalence rates of a range of mental disorders (WHO, 1992), emerging PDs (Winsper et al., 2015), self-harm, past suicide attempts, and LDs among young male and female incarcerated youth considering

the paucity of available studies among other groups of young people in contact with the youth justice system. A secondary aim was to determine the potential moderators of prevalence rates in terms of individual characteristics (age, gender, ethnicity) and study methodology (sample size, study quality).

Methods

Data sources

The review team decided on search terms by consulting related systematic reviews (Colins et al., 2010; Fazel et al., 2008) and conducting a pilot search. We searched MEDLINE (1946–August 2017), Embase (1947–2017), Psych INFO (1923–2017), and Web of Science (all years) combining the following key words: (juvenile* OR adol* OR young* OR youth* OR boy* OR girl*) AND (offen* OR prison* OR jail* OR incarcerat* OR custod* OR imprison* OR detain*) AND (mental health OR disord* OR prevalence OR suicid* OR depress* OR CD OR ODD OR ADHD OR PTSD OR personality disorder).

Search criteria

We were interested in the prevalence rates of a wide range of mental health disorders, and additionally, past suicide attempts and self-harm and LDs. We included: diagnosed mental disorders such as depression, dysthymia, panic disorder, social phobia, special phobia, separation anxiety disorder (SAD), generalized anxiety disorder (GAD), obsessive compulsive disorder (OCD), PTSD), and disruptive behavior disorders (conduct disorder, ODD, ADHD), mental health symptoms such as manic symptoms, psychotic symptoms, self-harm, and past suicide attempts. LDs and emerging PDs such as BPD, antisocial personality disorder (ASPD), narcissistic personality disorder (NPSD), schizoid personality disorder (STPD). We looked at incarcerated youth due to the low number of studies including justice-involved youth in other settings such as community and secure units.

Protocol and registration

The review protocol was registered with the PROSPERO International Prospective Register of Systematic Reviews on 27 November 2015 and can be accessed via the PROSPERO website at http://www.crd.york.ac.uk/PROSPERO. The PROSPERO registration number for the review is CRD42015029677.

Study selection criteria

Inclusion criteria:

1. incarcerated youth aged 10–20 years based on literature definitions of justice-involved youth (Fazel et al., 2008; Lewis & Scott-Samuel, 2013; Singleton, Gatward, & Meltzer, 1998);
2. diagnostic tools and/or structured or semi-structured psychiatric surveys and clinical diagnoses according to the Diagnostic and Statistical Manual of Mental Disorders (DSM)-III, IV, IV-TR, or V, and International Classification of Diseases (ICD)-10 criteria for mental disorders' diagnosis, structured clinical interview for DSM-IV Axis II PDs (SCID-II) for emerging PDs;
3. structured diagnostic interviews such as the Diagnostic Interview Schedule for Children (DISC 2.3) (Shaffer et al., 1996), Kiddy Schedule for Affective Disorders and Schizophrenia (K-SADS-PL) (Kaufman et al., 1997), Composite International Diagnostic Interview (CIDI) (Kessler & Üstün, 2004),and Practical Adolescent Dual Diagnostic Interview (PADDI) for self-harm and past suicide attempts (Estroff & Hoffmann, 2001);
4. Wechsler Adult Intelligence Scale (WAIS-III or IV) for >17 years and Wechsler Intelligence Scale for Children (WISC-IV) for <17 years to measure LDs. These tools have been widely used in the literature to measure LDs by identifying educational needs (Chitsabesan et al., 2006);
5. studies that stratified sample by gender;
6. studies published in English language;
7. gray literature unpublished studies; and
8. primary studies only.

Exclusion criteria:

1. research using the Voice DISC-computerised version for self-administration due to its limited capacity to identify misinterpreted questions without the presence of a clinician (Shaffer et al., 2000);
2. studies using only symptom inventories, such as the Massachusetts Youth Screening Instrument (MAYSI) were excluded due to their limited diagnostic value and lower validity. Including solely self-reports for mental health problems and symptoms would not allow for comparisons across studies (Fazel et al., 2008);
3. studies including primary substance abuse problems due to biased sampling (Fazel et al., 2008). Substance abuse rates are very prone to "reporting and ascertainment biases" (Fazel et al.,

2008). Substance abuse studies did not offer enough information to be included in this review. We excluded substance misuse, as Fazel and colleagues (2008) did in their review, due to selection and sampling biases. Colins et al. (2010) reported that studies on substance abuse prevalence including justice-involved populations not recently admitted are less likely to be representative due to less opportunities in prison settings where young people are monitored;
4. neurological problems and disorders such as traumatic brain injury, seizure disorders, and movement disorders (cerebral palsy);
5. community and forensic samples due to the very low number of such studies; and
6. systematic reviews with aggregated data.

Data extraction

A data extraction form (see Table 1) was created to record summarized results, sample size, geographical area, research design, clinical diagnosis-prevalence rate, diagnostic tool, interviewer, setting, and quality score.

Measures

ML and AS read the 93 full text articles for final inclusion in the review, and performed a methodological quality assessment for all 93 selected articles in accordance with the Joanna Briggs Institute (JBI) Appraisal Checklist for Studies Reporting Prevalence Data. The critical appraisal checklist consisted of 10 questions that the reviewer was called to answer with "yes" or "no" and "unclear." Studies that did not reach a score of "6" were excluded after being discussed with both reviewers. Inclusion in the review required that studies reached a score of at least "6." The reviewers agreed on the cutoff score before the critical appraisal in line with the current literature (Aromataris et al., 2014; Joanna Briggs Institute, 2015). Inter-rater reliability for quality assessment was 0.96 (Hallgren, 2012). IRR measures the level of agreement between two independent reviewers and ensures reliability of the reported data (Hallgren, 2012). The process of the quality assessment ensured that included studies met the desired methodological quality criteria for: the statistical analysis each study performed, assessment tool used, sampling method, sample size, sample representation, and study objectivity (see Table 3).

Statistical analyses

Meta-analysis

We computed the pooled prevalence of mental health problems in STATA 14.0 using the metaprop command (Nyaga, Arbyn, & Aerts, 2014). This command was recently introduced and has been significantly helpful in meta-analysis for prevalence studies by using the actual prevalence number, as a nominator and, the sample size, as denominator to compute prevalence proportion. We used the random effects model, as the levels of effect sizes were expected to vary. Overall prevalence was computed for each mental health problem, and then stratified by gender. Forest plots present prevalence rates with assigned study weights and 95% confidence intervals (CI) in the form of forest plots. The CIs represent the actual prevalence proportion.

Meta-regression and subgroup analysis

The causes of significant heterogeneity in prevalence estimates across studies were examined with sub-group and meta-regression analysis. Sub-group analysis facilitates a graphical comparison of pooled prevalence rates between sub-groups (e.g., female vs. male). Meta-regression expands on these findings by providing a statistical test of whether each sub-group factor is significantly related to variations in prevalence (Higgins & Thompson, 2002).

Several factors were identified based on the extant literature as having the potential to influence prevalence rates. Sample characteristics included gender (Dixon et al., 2004), age (Karnik et al., 2010), and ethnicity (Karnik et al., 2010; Shelton, 2001). Study methodology features comprised assessment tool (Fazel et al., 2008), time frame of prevalence (Grisso, 2004), sample size (Fazel et al., 2008), trial status (pre-/post-trial) (Grisso, 2004), and study quality—based on the JBI Critical Appraisal scores (Munn, Moola, Lisy, Riitano, & Tufanaru, 2014).

We dichotomized (with 0 as the reference category for the meta-regression analysis) characteristics as follows: gender (male = 0 vs. female = 1), sample size (small $n < 100 = 0$ vs. large $n \geq 100 = 1$) in line with Fazel's review, age (<16 years =0 vs. > 16 years = 1), and study quality score (high $\geq 7 = 1$ and low score $< 7 = 0$), and trial status (pre-trial = 0 vs. post-trial = 1). We entered time frame of prevalence (point = 0, period = 1 and lifetime prevalence = 2) as a categorical variable. Depending on the mental health problem and symptom, and each study's diagnostic criteria, we looked at point (1 week–1 month), period (6–12 months), and lifetime prevalence >12 months).

Table 1. Summary results of studies reporting on prevalence of mental health problems.

Authors	Study year	Sample size (*N*)	Setting	Age (Mean)	Sampling method	Country	Diagnostic tool	Interviewer	Quality score
Abrantes	2005	252	detention	16.3	Consecutive	USA	PADDI[a]	Staff workers	8
Ajiboye	2009	53	detention	17.3	Referrals	Nigeria	MINI-KID[b]	Researchers	7
Andrade	2004	116	parole	16.5	Convenient	Brazil	KSADS-PL[c]	Psychiatrist	8
Ariga	2008	64	detention	17.2	Consecutive	Japan	1.MINI-KID (Jap.version)	Researchers	8
Caufmann	1998	96	detention	17.2	Referrals	USA	PTSD module DSM-III-R criteria	Psychologist	7
Dixon	2004	100	detention	16.5	Random	Australia	K-SADS-PL	Psychologist	8
Duclos	1998	150	detention	15	Consecutive	USA	DISC-2.3,[d]CIDI for PTSD	Local lay interviewers	7
Eppright	1993	100	detention	14.6	Random	USA	DISC-Revised;SCID-II for personality disorders	Psychiatrist	7
Gaete	2014	489	detention	16.4	Convenient	Chile	MINI-KID	Psychologist	7
Gosden	2003	100	detention	16.7	Consecutive	Denmark	K-SADS-PL, SCID-II[e]	Psychiatrist	8
Gretton	2011	174	detention	16.3	Convenient	Canada	DISC-IV	Psychology graduates	9
Harrington	2005	97	detention	14.8	Consecutive	UK	K-SADS	Researchers	7
Hayes	2013	30	detention	14.9	Consecutive	Ireland	DISC[g]-IV;WAIS[f]	Researchers	6
Howard	2003	299	detention	16.5	Consecutive	Australia	self-report/structured questionnaire on self-harm & suicide attempts	Researchers	7
Indig	2009	293	detention	17	Purposive	Australia	WAIS-IV FOR 17<, WISC-IV	Psychologists	9
Karnik	2010	790	detention	16.8	Purposive	USA	SCID-IV DICA SIDP-IV for conduct disorder	Researchers (trained raters)-clinicians	9
Kohler	2009	38	detention	16	Purposive	Germany	DSM-IV–>SCID-I;SCID-II	Psychologists	7
Lader	1997	590	detention	18	Random	UK	PDs: (SCID-II), SCAN–>psychotic disorder;	Lay interviewers, psychiatrists-clinicians	9
Lederman	2004	493	detention	15.2	Consecutive	USA	DISC	Independent non-detention staff	8
Lennox	2013	219	detention	16.6	Consecutive	UK	K-SADS	Researcher	8
Plattner	2007	319	detention	16.7	Purposive	Austria	MINI-KID, MINI-KID suicidality mode	Psychiatrists	8
Pliszka	2000	50	detention	15.4	Consecutive	USA	DISC 2.3	Examiner	6
Rayner	2005	31	detention	14	Opportunistic	UK	K-SADS-E; WISC[h]	Researcher	6
Runchkin	2003	370	detention	16.4	Voluntary	Russia	K-SADS-PL	Psychiatrists	8
Steiner	1997	85	detention	16.6	Referrals	USA	PTSD module DSM-III-R criteria	Psychiatrist	7
Teplin	2002	1829	detention		Random	USA	DISC (2.3); DISC-IV (PTSD)	Psychology students	8
Timmons	1997	50	detention	15.8	Random	USA	DISC	Authors-researchers	6
Van Damme	2014	440	detention	15.9	Random	Belgium	DISC-IV	Students	8
Vreugdenhil	2004	204	detention	16.4	Consecutive	Netherlands	DISC-C	DISC-trained research psychologists	8
Zhou	2014	232	detention	16.8	Opportunistic	China	K-SADS-PL	Psychiatrist	9

[a]Practical Adolescent Dual Diagnostic Tool.
[b]Mini International Neuropsychiatric Interview for Children and Adolescents.
[c]Kiddie-Sads-Present and Lifetime Version.
[d]Composite International Diagnostic Interview.
[e]Structural Clinical Interview for Axis II disorders (personality disorders).
[f]Wechsler Adult Intelligence Scale.
[g]Diagnostic Interview Schedule for Children.
[h]Wechsler Intelligence Scale for Children.

Past suicide attempts and self-harm at any point were looked as lifetime.

For meta-regression, we performed univariate analysis for each mental health problem and potential moderating factor (e.g., each moderating factor was entered individually). If any of the moderating variables were significantly associated with heterogeneity, they were entered into multivariate meta-regression analysis to test their independent effects while controlling for other moderating factors (Higgins & Green, 2006).

Results

Study selection

We identified 7,689 articles eligible for screening after duplicates were removed. ML independently screened 100% of the titles and/or abstracts to identify studies for full text retrieval. AS screened 60% of the abstracts and titles as a reliability check. Inter-rater reliability (IRR) was good (kappa = 0.89) (Hallgren, 2012). Based on title and/or abstract 7,596 articles were excluded. Sixty-three studies were excluded based on study quality. Thus, 30 studies were included in the final review (see Figure 1). The lead author and coauthor (AS) extracted relevant data for all included studies. Where there was disagreement, a third author would have been sought but no disagreement occurred. Excluded studies were inserted in a different form where reasons for exclusion were provided for those studies considered to be initially included. As the flowchart (Figure 1) shows 63 studies were excluded based on the predetermined inclusion criteria. Twelve studies were excluded because they were repetitive reports-sub-studies, 23 studies used solely symptom inventories as the main diagnostic tool without a diagnostic psychiatric interview, 9 studies included population that was not of interest to this systematic review, 12 studies were methodologically weak reaching a very low quality score under 6/10, 4 four studies had insufficient data, and 2 studies were a letter to editor and a book chapter. In some cases, we retrieved multiple reports from the same study, then the study with the largest or most satisfactory dataset was kept. Those studies considered methodologically weak according to the JBI quality assessment criteria did not include representative samples of the targeted population and they solely used self-report measures and they had not stratified the samples by gender.

Sample and study characteristics

In total there were 8,953 participants (females = 2,306, males = 6,647) from 16 different countries (United States, Australia, United Kingdom, Ireland, Nigeria, Brazil, Chile, Denmark, Netherlands, Belgium, Germany, Austria, Russia, China, and Canada). The mean ages ranged from 14.8–18 years and sample sizes from 30 to 1,829 participants. Thirteen studies used DISC (Duclos et al., 1998; Eppright et al. 1993; Gretton & Clift, 2011; Margaret Hayes & Reilly, 2013; Karnik et al., 2010; Köhler, Heinzen, Hinrichs, & Huchzermeier, 2009; Lader et al., 2003; Lederman, Dakof, Larrea, & Li, 2004; Pliszka, Sherman, Barrow, & Irick, 2000; Teplin et al., 2002; Timmons-Mitchell et al., 1993; Van Damme, Colins, & Vanderplasschen, 2014; Vreugdenhil, Doreleijers, Vermeiren, Wouters, & Van Den Brink, 2004) as their diagnostic tool, while the rest used a variety of tools such as K-SADS, PADDI, MINI-KID, and CIDI. Details about the study tools are shown in Table 1.

Only three studies stratified their samples according to ethnicity (Lader et al., 2003; Indig et al., 2009; Teplin et al., 2002). Other studies included the proportion of different ethnic groups without providing specific prevalence rates of mental disorders (Abrantes et al., 2005; Duclos et al., 1998; Pliszka et al., 2000), thus we could not incorporate ethnicity into our statistical analysis. Lederman et al. (2004) stratified the sample according to first detention and more than one detention in a sample of 493 detained females.

Meta-analysis results

Please refer to Table 2 for all meta-analysis results. The core paper presents summary forest plots rather than individual results for each mental disorder. Individual forest plots are available on request from the author.

Overall (both genders combined), the highest pooled prevalence rates were observed for emerging ASPD, conduct disorder, and LDs. Rates were lower for depression, emerging BPD, ADHD, PTSD, and past suicide attempts. The lowest rates were observed for manic episodes, psychotic symptoms, phobias and panic disorders, and emerging narcissistic and schizotypal PDs. Females had higher prevalence rates for depression, dysthymia, self-harm and suicide, PTSD, (GAD), SAD, ADHD, and emerging BPD. Males had higher prevalence rates for conduct disorder and (ASPD) along with borderline, mild, and moderate LD scores.

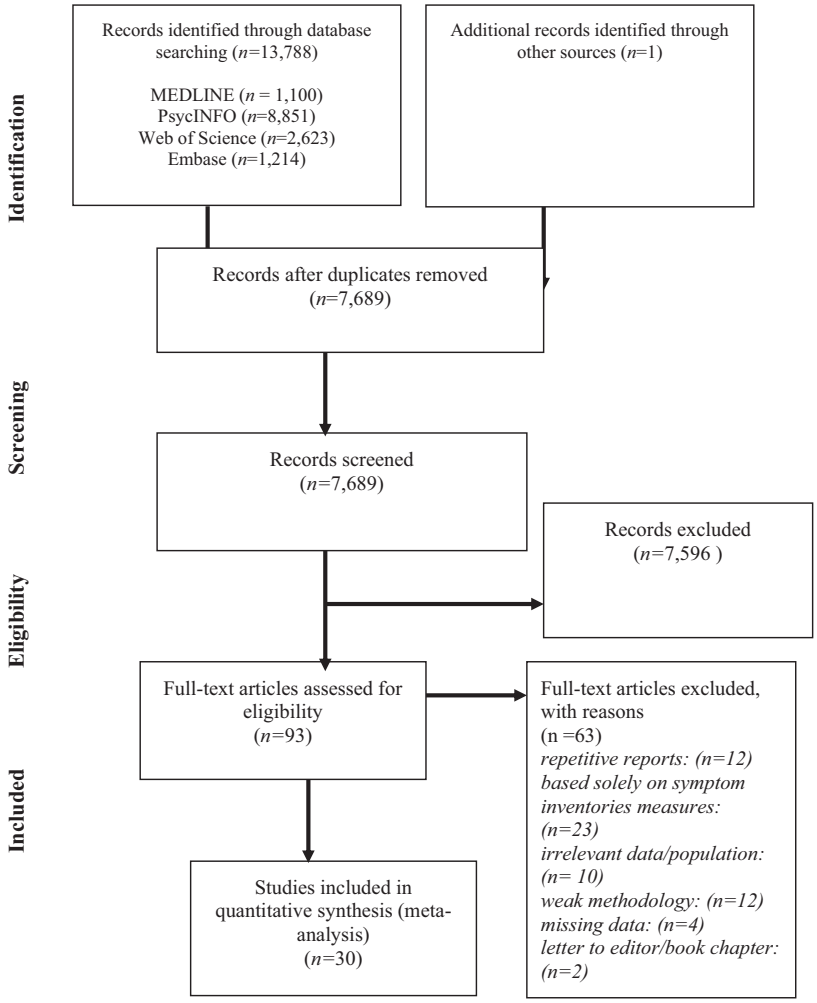

Figure 1. PRISMA Flow diagram outlining searching and screening strategy.

Subgroup analysis and meta-regression results

Pooled prevalence rates for several mental health problems were not significantly heterogeneous across studies and gender (ODD, OCD, psychotic symptoms, self-harm, manic episodes, and panic disorder). Cochran Q and I^2 statistic are used to explain heterogeneity and variance. Cochran Q is presented with χ^2 value (Fazel et al., 2008). The I^2 statistic indicates whether there is actual heterogeneity with values of 25%, 50%, and 75% highlighting the level of heterogeneity (Young et al., 2015). Therefore, we did not conduct meta-regressions for these mental disorders. We did not perform meta-regression analysis for emerging PDs and LDs due to the low number of studies (Higgins & Green, 2006).

We examined the influence of the moderating factors on the prevalence of depression, dysthymia, suicide attempts, PTSD, GAD, SAD, conduct disorder, and ADHD. There were only moderating effects for depression, PTSD, and conduct disorder. The moderating effects of the remaining disorders were not examined because there were less than nine studies, as suggested by Higgins and Green (2006). Supplementary meta-regression tables can be provided upon request.

Gender

Female gender moderated positively the pooled prevalence of depression ($\beta = 1.13$, $SE = 0.06$, $p < 0.05$); dysthymia ($\beta = 0.17$, $SE = 0.04$, $p < 0.01$); past suicide attempts ($\beta = 0.30$, $SE = 0.08$, $p < 0.01$); PTSD ($\beta = 0.17$, $SE = 0.05$, $p < 0.01$); and SAD ($\beta = 0.15$, $SE = 0.06$, $p < 0.05$). Females had significantly higher prevalence of depression, past suicide attempts, PTSD, and separation anxiety disorder (see Table 2, Figure 2).

Sample size

Small sample size moderated negatively the prevalence of PTSD ($\beta = -0.26$, $SE = 0.07$, $p < 0.05$) and conduct

Table 2. Pooled prevalence of mental health problems with chi-square and I^2 measures of heterogeneity.

Diagnosis	*N* Studies	Male prevalence with 95% CIs	χ^2 value for males	I^2 value for males	Female prevalence with 95% CIs	χ^2 value for females	I^2 values for females	Overall prevalence
Depression	23	17% (12%–21%)	706.29	97.17%	29% (19%–39%)	471.51	97.45%	21% (17–24%)
Dysthymia	9	5% (2%–8%)	142.61	95%	22% (14%–31%)	33.4	88%	11% (7–15%)
Manic episodes	10	3% (1%–5%)	68.34	88.29%	5% (1%–8%)	22.10	81.90%	3% (2–5%)
Self-harm	3	11% (7%–15)	18.38	83.68%	18% (5%–32%)	30.58	90.19%	13% (9–18%)
Suicidal attempts	9	16% (12%–19%)	86.06	90.70%	27% (20%–34%)	37.33	81.25%	20% (16–25%)
Psychotic illness	14	6% (4%–8%)	153.81	92.20%	7% (3%–11%)	45.19	84.51%	6% (4–7%)
PTSD[a]	19	9% (6%–12%)	301.84	91.85%	27% (18%–35%)	110.49	94.70%	14% (11–17%)
GAD[b]	13	6% (4%–8%)	50.92	82.33%	9% (5%–13%)	60.02	86.67%	7% (5–9%)
SAD[c]	11	9% (6%–12%)	75.39	89.39%	26% (11%–40%)	195.56	97.95%	14% (10–18%)
OCD[d]	13	5% (3%–7%)	143.24	92.32%	7% (4%–10%)	26.46	65.99%	6% (4–7%)
Phobia	10	4% (3%–6%)	9.58	16.50%	10% (4%–16%)	19.15	73.89%	5% (4–7%)
Panic disorder	12	3% (2%–5%)	70.57	85.83%	7% (3%–10%)	30.27	80.18%	4% (2–5%)
Conduct disorder	23	68% (56%–79%)	2363.17	99.15%	64% (45%–83%)	1282.65	99.06%	66% (56–76%)
ODD[e]	17	26% (20%–32%)	335.21	95.82%	28% (21%–35%)	117.65	91.50%	27% (22–31%)
ADHD[f]	21	19% (14%–24%)	334.79	94.92%	27% (16%–37%)	181.71	95.05%	22% (17–26%)
BPD[g]	5	15% (10%–21%)	34.42	85.47%	42% (35%–50%)	34.42	97.09%	21% (13–28%)
ASPD[h]	3	81% (69%–91%)	55.49	94.59%	32% (1%–94%)	216.95	99.08%	62% (39–82%)
NPD[i]	3	7% (6%–8%)	1.93	0.00%	8% (4%–14%)	.	0.00%	7% (6–8%)
STPD[j]	3	2% (1%–3%)	0.06	0.00%	2% (1%–6%)	.	0.00%	2% (1–3%)
Borderline LD[k]	3	33% (18%–47%	14.13	85.84%	26% (15%–41%)	.	0.00%	31% (20–43%)
Mild LD	3	23% (12%–34%)	8.84	77.38%	5% (1%–17%)	.	0.00%	18% (8–28%)
Moderate LD	2	51% (47%–56%)	27.94	96.42%	35% (27%–43%)	27.94	96.42%	43% (30–56%)

[a]Post-traumatic stress disorder.
[b]Generalized Anxiety Disorder.
[c]Separation Anxiety Disorder.
[d]Obsessive Compulsive Disorder.
[e]Oppositional Defiant Disorder.
[f]Attention Deficit Hyperactivity Disorder.
[g]Borderline Personality Disorder.
[h]Antisocial Personality Disorder.
[i]Narcissistic Personality Disorder.
[j]Schizotypal Personality Disorder.
[k]Learning Disabilities.

Table 3. JBI quality assessment for 30 studies.

Study	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Abrantes	Y	Y	U	Y	U	Y	Y	Y	U	N
Ajiboye	Y	Y	N	Y	U	Y	Y	Y	N	Y
Andrade	Y	Y	Y	Y	U	Y	N	Y	U	Y
Ariga	Y	Y	N	Y	Y	Y	Y	Y	N	N
Caufmann	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
Dixon	Y	Y	Y	Y	U	Y	Y	Y	Y	Y
Duclos	Y	Y	Y	Y	U	Y	Y	Y	Y	U
Eppright	Y	Y	Y	U	U	Y	Y	Y	Y	Y
Gaete	Y	Y	Y	U	Y	Y	Y	Y	U	U
Gosden	Y	Y	Y	Y	U	Y	Y	Y	U	Y
Gretton	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Harrington	Y	Y	Y	Y	U	Y	N	Y	N	Y
Hayes	N	Y	N	Y	Y	Y	Y	Y	N	N
Howard	N	Y	Y	Y	Y	Y	Y	Y	N	N
Indig	Y	Y	Y	Y	Y	Y	Y	Y	N	Y
Karnik	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
Kohler	N	N	Y	Y	Y	Y	Y	Y	N	Y
Lader	Y	Y	Y	Y	Y	Y	Y	Y	N	Y
Lederman	Y	Y	Y	Y	Y	Y	Y	Y	N	N
Lennox	N	Y	N	Y	Y	Y	Y	Y	Y	Y
Plattner	Y	Y	Y	Y	U	Y	Y	Y	Y	Y
Pliszka	Y	N	Y	N	U	Y	Y	Y	U	U
Rayner	Y	Y	Y	N	U	Y	Y	Y	U	N
Runchkin	Y	Y	Y	Y	U	Y	Y	Y	Y	Y
Steiner	N	Y	N	Y	N	Y	Y	Y	Y	Y
Teplin	Y	Y	Y	Y	U	Y	Y	Y	Y	Y
Timmons	Y	Y	Y	Y	U	Y	Y	Y	Y	Y
Van Damme	Y	Y	Y	Y	U	Y	Y	Y	Y	Y
Vreugdenhil	Y	Y	Y	Y	Y	Y	Y	Y	N	U
Zhou	Y	Y	Y	Y	U	Y	Y	Y	Y	Y

Y = yes; N = no; U = unknown.

This table displays the reviewers' answers to quality assessment questions. The highest score was 10 for a study that met all quality assessment criteria.

disorder ($\beta = -0.22$, $SE = 0.10$, $p < 0.05$). PTSD and conduct disorder were less prevalent in large sample studies (more than 100 participants) than smaller sample size studies.

Study quality

Study quality moderated positively the prevalence of conduct disorder ($\beta = 0.10$, $SE = 0.18$, $p < 0.05$) when we controlled for the other moderators (gender, setting, sample size, age). Conduct disorder was more prevalent in lower quality studies (less than 7 quality square) than higher quality studies.

Discussion

In the current review we synthesized the prevalence rates of mental disorders, mental health problems, past suicide attempts and LDs among youth in custody. We will discuss these findings in particular, as these disorders have been relatively neglected in the extant youth justice population literature. The key findings of this review concerned high rates of internalizing disorders, conduct disorder and emerging ASPD among females. Another key finding suggested high rates of suicide attempts and learning disabilities in both males and females. These findings add to the existing knowledge on the prevalence of mental health psychopathology in youth-justice population and have further implications on policy and practice across secure settings.

Meta-analysis results

Emerging ASPD was the most common disorder among young male incarcerated youth, with a pooled prevalence of 81%. The high rates of emerging ASPD traits are consistent with previous reviews of prison populations. However, this review found higher emerging ASPD rates in both genders. Fazel and Danesh (2002) for example, found that 65% males and 21% females presented with ASPD. In our review, 35% incarcerated female youth presented with emerging ASPD. Overall more than half of the participants met the clinical criteria for emerging ASPD. This highlights the need for the appropriate identification and treatment of these personality traits and pattern of problematic antisocial behavior in this population. There were only a limited number of studies examining ASPD among incarcerated youth and there were few prospective studies looking at the criminal trajectory of incarcerated youth with antisocial traits. These studies particularly addressed that while we cannot diagnose ASPD before 18 years, they examined whether this group presented with ASPD traits earlier (Timmons-Mitchell et al., 1993). Future studies may consider the extent to which antisocial traits precede or follow offending behavior (Winsper et al., 2013).

Conduct disorder generated similar prevalence rates between males and females, as previous findings (Fazel et al., 2008). Non-DISC tools elicited higher prevalence rates than DISC, and this might be consistent with the assertion that DISC might underestimate prevalence of conduct disorder among young individuals (Fazel et al., 2008). A clear link between conduct disorder and criminal behavior cannot be made but comorbidity with other mental health disorders such ADHD, ODD, PTSD might establish a stronger relationship with violent behavior (Grisso, 2004).

In addition, conduct disorder might be a prodromal sign of ASPD and the results of this study showed considerably high prevalence of conduct disorder especially in female youth. The results of the current review diverge from those of Fazel's et al. (2008) and Colin's et al. (2010) reviews. We found a higher pooled prevalence of conduct disorder especially in young females. The pooled prevalence for

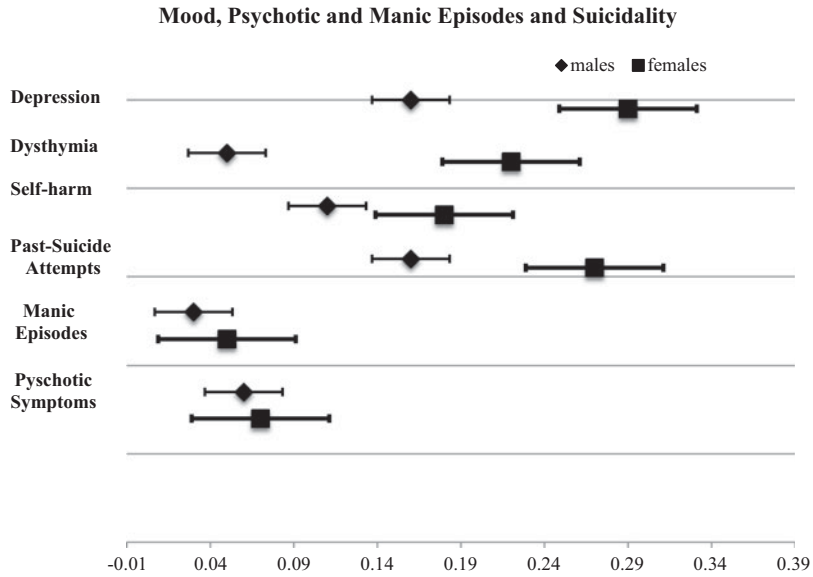

Figure 2. Pooled prevalence figure on mood and psychotic disorders among young offenders.

males was 68% and for females 66%, while Fazel found a prevalence of 52.8% for both genders. Colins who examined CD in males only reported a prevalence of 46.4%. The reasons for the higher prevalence in our review are unclear and may reflect changes in diagnostic criteria, methodological variations across studies, or a genuine increase in CD rates (Singh & Winsper, 2017).

The pooled prevalence of emerging borderline personality disorder (BPD) was 21%. More female incarcerated youth (42%) presented with emerging BPD symptoms than males (15%). This gender pattern is largely consistent with the adult and adolescent literature (Hill et al., 2014; Black et al., 2007), though there are suggestions that rates in males may be higher than previously thought (Grant et al., 2008), thus indicating that BPD should not be overlooked in male populations (Black et al., 2007). Studies suggest that justice-involved populations with BPD have an increased risk of reoffending compared to those without BPD, and that BPD in justice-involved populations is associated with substantial psychological stress and impaired quality of life (Black et al., 2007). This highlights the need for correctional facilities to improve their screening and treatment for emerging BPD traits, particularly in young people for whom early symptoms of the disorder is often under-recognized (Winsper et al., 2015, 2016).

Attempted suicide rates were three times higher than rates in the community. Thus, suicide risk is a major concern for incarcerated youth (Lambie & Randell, 2013; Moore Gaskin, & Indig, 2015). Prior research suggests that suicide attempts elevate once young people are admitted to custodial settings (Abram et al., 2008). The risk for suicidal behavior could be related to ongoing mental health problems, but also attributable to being incarcerated and exposed to bullying and other stressors (Lambie & Randell, 2013; Moore et al., 2015). Substance abuse could increase the risk for suicide and this review did not examine the prevalence on substance abuse rates to make such inferences. However, including significantly heterogeneous rates would limit comparison between studies. More regular screening for young people presenting with concerning behavior should take place to reduce the risk of suicide attempts (Bhatta et al., 2014).

Congruent with previous reports, the pooled prevalence of LDs was high in our review (Talbot & Riley, 2007). Talbot and Riley (2007) found that 39% had some kind of learning difficulty or disability; we found an even higher pooled rate of 51% (moderate IQ scores) in youth only populations. Previous studies have reported that incarcerated youth with LDs are more likely to experience bullying and control restraints in secure settings, which shows their increased vulnerability and the need to improve service provision and screening for this group (Talbot & Riley, 2007). However, the prevalence rate of justice-involved population with LDs is unclear to further our understanding in the magnitude of the problem.

Meta-regression results

Gender was a significant moderator of the pooled prevalence of depression, dysthymia, past suicide attempts, PTSD, and SAD, indicating that these disorders and symptoms are significantly more common in

females. Of these disorders, Fazel and Danesh (2002) only examined depression, and similarly found that gender accounted for heterogeneity in prevalence rates. Depression and dysthymia were found to be higher among females than males, as previous studies have shown (Chitsabesan & Bailey, 2006; Fazel et al., 2008). In the current review 29% females had depression likewise in Fazel's review. Chitsabesan et al. (2006) found slightly higher depression rates (35%) among female detained youth. In the context of the criminal justice system and incarcerated youth, dysthymic disorder, which is a chronic disease, can also increase suicidal thoughts, which has further implications on existing policy and practice in youth justice settings (Abram et al., 2008).

Incarcerated youth may have been physically or sexually abused during childhood, particularly females (Moore et al., 2015). Moore and colleagues delineated a cohort of incarcerated youth in New South Wales and reported that females tended to report on child abuse and neglect more frequently than males (Moore et al., 2015). In this review, the results showed similar discrepancy between males' and females' PTSD rates with females far outweighing males. Fitzgerald et al. (2012) assert that adverse childhood experiences can shape the criminal career of individuals in contact with the criminal justice system, and there is a relationship between violent offending such as sexual offenses, assaults, attempted murder, and childhood abuse (Hughes et al., 2017).

The higher prevalence of PTSD and suicide attempts in females is consistent with the literature outside of criminal justice populations (Tekin et al., 2016). PTSD is highly co-morbid with emerging BPD in youths (Winsper et al., 2016). It is plausible that some females in contact with the criminal justice system may have a constellation of symptoms: emerging BPD, PTSD, history of suicide attempts, and dysthymia, which are associated with previous exposure to trauma (Winsper et al., 2016). However, in this review we did not examine comorbid mental health problems and symptoms, which is an area of increasing concern. These, in turn, may increase risk of offending (Moore et al., 2015), although they could also result from being incarcerated. Future prospective studies may examine these links.

Limitations

When considering the results of our review, it is important to consider certain limitations. First, we planned a priori to look at the prevalence of mental health problems across various ethnic groups. However, we did not identify enough studies reporting prevalence rates according to ethnicity. Future studies should include different ethnic groups to allow comparisons in prevalence rates and address the needs of these groups. Second, we could not compute comorbid mental health problems due to missing information from the included studies. This group of young people presents with complex and multiple needs and mental health problems overlooked by the current literature. Justice-involved youth in various settings such as secure hospitals and community placements have a number of mental health problems and symptoms that seem to be the most difficult to treat (Hill et al., 2014). There were not enough studies to examine comorbid mental health difficulties. Third, this review excluded substance abuse problems, and therefore, the results are not entirely representative. This is an important methodological limitation considering that substance abuse is a mental health risk factor. Substance abuse concurs with other mental health problems. However, it is likely that substance abuse rates among incarcerated youth are not accurate due to access to substances in prison settings and response bias (Fazel et al., 2008). Substance abuse rates vary across countries considering the different youth-justice systems and available mental health services, where countries offering adequate mental health services would have lower substance abuse rates in prison settings. Accordingly, it depends on how each region considers substance abuse either as an offense or a disorder. Fourth, the number of studies including emerging PDs and LDs was low limiting the reliability of estimated rates and forest plots might display inflated rates. Last, we included studies that used the Weschler criteria focusing on reading comprehension, reasoning and working memory to measure LDs that might not apply to the various international contexts (Gomez, Vance, & Watson, 2016).

Implications and conclusion

As the findings from this review suggest, the youth justice system and mental health services within should work together to adopt an interdisciplinary person-centred approach targeting incarcerated youth (Underwood & Washington, 2016). By addressing the complex needs of this youth, we can move a step nearer to rehabilitation and providing community alternatives to the more traumatized groups through education and recovery programs.

Incarcerated female youth present with an atypical pattern of psychopathology (in comparison to community populations) that needs further investigation, such as high CD and ASPD rates. Future research should focus on disorders that are traditionally more common in males including CD, ADHD, and ASPD. Mental health services for detained young people presenting with emerging personality disorder symptoms should design effective care pathways (Hill et al., 2014) addressing past trauma and insecure attachment styles to interrupt the psychopathology and reduce the risk of reoffending. This should be achieved by offering developmentally driven training to staff members and healthcare professionals involved in young people's care and also providing community and school programs for the most susceptible youth identified as high risk (Coid, 2003). In order to improve current prevention and intervention services for youth with emerging PDs, we need to account for present and past factors in young people's lives to change policy and clinical practice.

Emerging PDs were highly prevalent in both genders. As research suggests PDs are predictors of reoffending, these need to be adequately treated in younger populations (Coid, 2003). Investing in empirically supported intervention strategies has the potential to interrupt the criminal trajectory associated with emerging PDs (Vizard, 2008; Young et al., 2015). Earlier recognition of emerging PDs would accelerate treatment and also reinforce strategies such as Psychologically Informed Planned Environments initiated in the UK to reduce destructive behaviors among incarcerated adult groups with PDs (Turley, Payne, & Webster, 2013).

LDs were also common in this sample, and the research literature suggests a link between LDs and reoffending (Talbot & Riley, 2007). Studies have been using IQ-cut off scores to detect LDs. Incarcerated youth with LDs may lack understanding of their detention and can become victims of bullying (Talbot & Riley, 2007). Exacerbating these problems, specialist services, such as mental health-in reach, are often not available (Chitsabesan et al., 2006). Consequently, incarcerated youth with LDs may be at high risk of reoffending and developing further behavioral problems (Cortiella & Horowitz, 2014). Therefore, it is necessary to invest more in education for young individuals while in prison and more importantly when they return to the community (Cortiella & Horowitz, 2014). Youth with such complex needs should be diverted from the youth justice system and re-integrated into structured community programs aiming to rehabilitation and recovery (Underwood & Washington, 2016). As of now, young people with LDs are more likely to experience school exclusion and be in contact with the youth justice system (Cortiella & Horowitz, 2014).

ORCID

Maria Livanou http://orcid.org/0000-0001-7864-5878
Catherine Winsper http://orcid.org/0000-0002-0045-7524
Swaran P. Singh http://orcid.org/0000-0003-3454-2089

References

Abram, K. M., Choe, J. Y., Washburn, J. J., Teplin, L. A., King, D. C., & Dulcan, M. K. (2008). Suicidal ideation and behaviors among youths in juvenile detention. *Journal of the American Academy of Child & Adolescent Psychiatry*, *47*(3), 291–300. doi:10.1097/CHI.0b013e318160b3ce

Abrantes, A. M., Hoffmann, N. G., & Anton, R. (2005). Prevalence of co-occurring disorders among juveniles committed to detention centers. *International Journal of Offender Therapy and Comparative Criminology*, *49*(2), 179–193. doi:10.1177/0306624X04269673

Aromataris, E., Fernandez, R. S., Godfrey, C., Holly, C., Khalil, H., & Tungpunkom, P. (2014). Methodology for JBI umbrella reviews.

Bhatta, M. P., Jefferis, E., Kavadas, A., Alemagno, S. A., & Shaffer-King, P. (2014). Suicidal behaviors among adolescents in juvenile detention: Role of adverse life experiences. *PloS One*, *9*(2), e89408. doi:10.1371/journal.pone.0089408

Black, D. W., Gunter, T., Allen, J., Blum, N., Arndt, S., Wenman, G., & Sieleni, B. (2007). Borderline personality disorder in male and female offenders newly committed to prison. *Comprehensive Psychiatry*, *48*(5), 400–405. doi:10.1016/j.comppsych.2007.04.006

Chitsabesan, P., & Bailey, S. (2006). Mental health, educational and social needs of young offenders in custody and in the community. *Current Opinion in Psychiatry*, *19*(4), 355–360. doi:10.1097/01.yco.0000228753.87613.01

Chitsabesan, P., Kroll, L., Bailey, S. U. E., Kenning, C., Sneider, S., MacDonald, W., & Theodosiou, L. (2006). Mental health needs of young offenders in custody and in the community. *British Journal of Psychiatry*, *188*(6), 534–540. doi:10.1192/bjp.bp.105.010116

Coid, J. (2003). Epidemiology, public health and the problem of personality disorder. *British Journal of Psychiatry*, *182*(S44), s3–s10. doi:10.1192/bjp.182.44.s3

Colins, O., Vermeiren, R., Vreugdenhil, C., van den Brink, W., Doreleijers, T., & Broekaert, E. (2010). Psychiatric disorders in detained male adolescents: A systematic literature review. *The Canadian Journal of Psychiatry*, *55*(4), 255–263. doi:10.1177/070674371005500409

Cortiella, C., & Horowitz, S. H. (2014). *The state of learning disabilities: Facts, trends and emerging issues*. New York: National Center for Learning Disabilities.

Dixon, A., Howie, P., & Starling, J. (2004). Psychopathology in female juvenile offenders. *Journal of Child Psychology and Psychiatry, And Allied disciplines*, *45*(6), 1150–1158. doi:10.1111/j.1469-7610.2004.00307.x

Duclos, C. W., Beals, J., Novins, D. K., Martin, C., Jewett, C. S., & Manson, S. M. (1998). Prevalence of common psychiatric disorders among American Indian adolescent detainees. *Journal of the American Academy of Child & Adolescent Psychiatry*, *37*(8), 866–873. doi:10.1097/00004583-199808000-00017

Einat, T., & Einat, A. (2008). Learning disabilities and delinquency: A study of Israeli prison inmates. *International Journal of Offender Therapy and Comparative Criminology*, *52*(4), 416–434. doi:10.1177/0306624X07307352

Eppright, T. D., Kashani, J. H., Robison, B. D., & Reid, J. C. (1993). Comorbidity of conduct disorder and personality disorders in an incarcerated juvenile population. *The American Journal of Psychiatry*, *1*(50), 1233.

Estroff, T. W., & Hoffmann, N. G. (2001). *PADDI: Practical adolescent dual diagnosis interview*. Smithfield, RI: Evince Clinical Assessments.

Fazel, S., Doll, H., & Långström, N. (2008). Mental disorders among adolescents in juvenile detention and correctional facilities: A systematic review and metaregression analysis of 25 surveys. *Journal of the American Academy of Child & Adolescent Psychiatry*, *47*(9), 1010–1019.

Fazel, S., & Danesh, J. (2002). Serious mental disorder in 23000 prisoners: A systematic review of 62 surveys. *Lancet (London, England))*, *359*(9306), 545–550. doi:10.1016/S0140-6736(02)07740-1

Fitzgerald, R., Mazerolle, P., Piquero, A. R., & Ansara, D. L. (2012). Exploring sex differences among sentenced juvenile offenders in Australia. *Justice Quarterly*, *29*(3), 420–447. doi:10.1080/07418825.2011.565361

Gallagher, C. A., & Dobrin, A. (2006). Deaths in juvenile justice residential facilities. *Journal of Adolescent Health*, *38*(6), 662–668. doi:10.1016/j.jadohealth.2005.01.002.

Gomez, R., Vance, A., & Watson, S. D. (2016). Structure of the Wechsler Intelligence Scale for Children–Fourth Edition in a group of children with ADHD. *Frontiers in Psychology*, *7*, 737.

Grant, B. F., Chou, S. P., Goldstein, R. B., Huang, B., Stinson, F. S., Saha, T. D., … Ruan, W. J. (2008). Prevalence, correlates, disability, and comorbidity of DSM-IV borderline personality disorder: Results from the Wave 2 National Epidemiologic Survey on Alcohol and Related Conditions. *The Journal of Clinical Psychiatry*, *69*(4), 533. doi:10.4088/JCP.v69n0404

Gretton, H. M., & Clift, R. J. (2011). The mental health needs of incarcerated youth in British Columbia, Canada. *International Journal of Law and Psychiatry*, *34*(2), 109–115. doi:10.1016/j.ijlp.2011.02.004

Grisso, T. (2004). *Double jeopardy: Adolescent offenders with mental disorders*. Chicago: University of Chicago Press.

Grisso, T. (2008). Adolescent offenders with mental disorders. *The Future of Children*, 143–164.

Hallgren, K. A. (2012). Computing inter-rater reliability for observational data: An overview and tutorial. *Tutorials in Quantitative Methods for Psychology*, *8*(1), 23. doi:10.20982/tqmp.08.1.p023

Harrington, R. C., Kroll, L., Rothwell, J., McCarthy, K., Bradley, D., & Bailey, S. (2005). Psychosocial needs of boys in secure care for serious or persistent offending. *Journal of Child Psychology and Psychiatry, and Allied disciplines*, *46*(8), 859–866. doi:10.1111/j.1469-7610.2004.00388.x

Higgins, J. P., & Thompson, S. G. (2002). Quantifying heterogeneity in a meta-analysis. *Statistics in medicine*, *21*(11), 1539–1558. doi:10.1002/sim.1186.

Higgins, J. P., & Green, S. (2006). Cochrane handbook for systematic reviews of interventions.

Hill, S. A., Brodrick, P., Doherty, A., Lolley, J., Wallington, F., & White, O. (2014). Characteristics of female patients admitted to an adolescent secure forensic psychiatric hospital. *The Journal of Forensic Psychiatry & Psychology*, *25*(5), 503–519. doi:10.1080/14789949.2014.933863

Hill, S. A., Argent, S. E., Lolley, J., & Wallington, F. (2016). Characteristics of male patients admitted to an adolescent secure forensic psychiatric hospital. *The Journal of Forensic Psychiatry & Psychology*, *27*(1), 21–37. doi:10.1080/14789949.2015.1094117

Hughes, N. (2012). Nobody made the connection: The prevalence of neurodisability in young people who offend.

Hughes, N., Chitsabesan, P., Bryan, K., Borschmann, R., Swain, N., Lennox, C., & Shaw, J. (2017). Language impairment and comorbid vulnerabilities among young people in custody. *Journal of Child Psychology and Psychiatry*, *58*(10), 1106–1113. doi:10.1111/jcpp.12791

Indig, D., Vecchiato, C., Haysom, L., Beilby, R., Carter, J., Champion, U., … Muir, P. (2009). 2009 NSW young people in custody health survey: Full report. *Justice Health and Juvenile Justice, Sydney*, 77–78.

Joanna Briggs Institute, & Joanna Briggs Institute. (2014). Reviewers' manual: 2011 edition. Adelaide: JBI. Accessed 15 May 2015, from https://joannabriggs.org/assets/docs/sumari/ReviewersManual_Mixed-Methods-Review-Methods-2014-ch1.pdf.

Joseph, N., & Benefield, N. (2012). A joint offender personality disorder pathway strategy: An outline summary. *Criminal Behaviour and Mental Health*, *22*(3), 210–217. doi:10.1002/cbm.1835

Karnik, N. S., Soller, M. V., Redlich, A., Silverman, M. A., Kraemer, H. C., Haapanen, R., & Steiner, H. (2010). Prevalence differences of psychiatric disorders among youth after nine months or more of incarceration by race/ethnicity and age. *Journal of Health Care for the Poor and Underserved*, *21*(1), 237–250. doi:10.1353/hpu.0.0261

Kaszynski, K., Kallis, D. L., Karnik, N., Soller, M., Hunter, S., Haapanen, R., … Steiner, H. (2014). Incarcerated youth with personality disorders: Prevalence, comorbidity and convergent validity. *Personality and Mental Health*, *8*(1), 42–51. doi:10.1002/pmh.1241

Kaufman, J., Birmaher, B., Brent, D., Rao, U. M. A., Flynn, C., Moreci, P., … Ryan, N. (1997). Schedule for affective disorders and schizophrenia for school-age children-present and lifetime version (K-SADS-PL): Initial reliability and validity data. *Journal of the American Academy of Child & Adolescent Psychiatry*, *36*(7), 980–988. doi:10.1097/00004583-199707000-00021

Kessler, R. C., & Üstün, T. B. (2004). The world mental health (WMH) survey initiative version of the world health organization (WHO) composite international diagnostic interview (CIDI). *International Journal of Methods in Psychiatric Research*, *13*(2), 93–121. doi:10.1002/mpr.168

Köhler, D., Heinzen, H., Hinrichs, G., & Huchzermeier, C. (2009). The prevalence of mental disorders in a German

sample of male incarcerated juvenile offenders. *International Journal of Offender Therapy and Comparative Criminology*, *53*(2), 211–227. doi:10.1177/0306624X07312950

Lader, D., Singleton, N., & Meltzer, H. (2003). Psychiatric morbidity among young offenders in England and Wales. *International Review of Psychiatry*, *15*(1–2), 144–147. doi:10.1080/0954026021000046074

Lambie, I., & Randell, I. (2013). The impact of incarceration on juvenile offenders. *Clinical Psychology Review*, *33*(3), 448–459. doi:10.1016/j.cpr.2013.01.007

Lederman, C. S., Dakof, G. A., Larrea, M. A., & Li, H. (2004). Characteristics of adolescent females in juvenile detention. *International Journal of Law and Psychiatry*, *27*(4), 321–337. doi:10.1016/j.ijlp.2004.03.009

Lewis, C., & Scott-Samuel, A. (2013). Health needs assessment of young offenders in the youth justice system on Merseyside.

Loucks, N. (2007). No one knows: Offenders with learning difficulties and learning disabilities: Review of prevalence and associated needs. *Prison Reform Trust, London*.

Margaret Hayes, J., & Reilly, G. O. (2013). Psychiatric disorder, IQ, and emotional intelligence among adolescent detainees: A comparative study. *Legal and Criminological Psychology*, *18*(1), 30–47. doi:10.1111/j.2044-8333.2011.02027.x.

Moore, E., Gaskin, C., & Indig, D. (2015). Attempted suicide, self-harm, and psychological disorder among justice-involved youth justice-involved youth justice-involved youth in custody. *Journal of Correctional Health Care*, *21*(3), 243–254. doi:10.1177/1078345815584849

Munn, Z., Moola, S., Lisy, K., Riitano, D., & Tufanaru, C. (2014). Methodological guidance for systematic reviews of observational epidemiological studies reporting prevalence and cumulative incidence data. *International Journal of Evidence-Based Healthcare*, *13*(3), 147–153. doi:10.1097/XEB.0000000000000054

Nyaga, V. N., Arbyn, M., & Aerts, M. (2014). Metaprop: A Stata command to perform meta-analysis of binomial data. *Archives of Public Health = Archives Belges de Sante Publique*, *72*(1), 39. doi:10.1186/2049-3258-72-39

Organisation mondiale de la santé, World Health Organization, & WHO. (1992). *The ICD-10 classification of mental and behavioural disorders: Clinical descriptions and diagnostic guidelines* (Vol. 1). Geneva: World Health Organization.

Penner, E. K., Roesch, R., & Viljoen, J. L. (2011). Young offenders in custody: An international comparison of mental health services. *International Journal of Forensic Mental Health*, *10*(3), 215–232. doi:10.1080/14999013.2011.598427

Pliszka, S. R., Sherman, J. O., Barrow, M. V., & Irick, S. (2000). Affective disorder in juvenile offenders: A preliminary study. *American Journal of Psychiatry*, *157*(1), 130–132. doi:10.1176/ajp.157.1.130

Prison Reform Trust, N. (2012). Bromley Briefings Prison Factfile.

Shaffer, D., Fisher, P., Lucas, C. P., Dulcan, M. K., & Schwab-Stone, M. E. (2000). NIMH Diagnostic Interview Schedule for Children Version IV (NIMH DISC-IV): Description, differences from previous versions, and reliability of some common diagnoses. *Journal of the American Academy of Child & Adolescent Psychiatry*, *39*(1), 28–38. doi:10.1097/00004583-200001000-00014

Shaffer, D., Fisher, P., Dulcan, M. K., Davies, M., Piacentini, J., Schwab-Stone, M. E., … Canino, G. (1996). The NIMH Diagnostic Interview Schedule for Children Version 2.3 (DISC-2.3): Description, acceptability, prevalence rates, and performance in the MECA study. *Journal of the American Academy of Child & Adolescent Psychiatry*, *35*(7), 865–877. doi:10.1097/00004583-199607000-00012

Shelton, D. (2001). Emotional disorders in young offenders. *Journal of Nursing Scholarship*, *33*(3), 259–263. doi:10.1111/j.1547-5069.2001.00259.x

Shiner, R. L., & Allen, T. A. (2013). Assessing personality disorders in adolescents: Seven guiding principles. *Clinical Psychology: Science and Practice*, *20*(4), 361–377. doi:10.1007/978-90-368-0931-3*31.

Singh, S. P., & Winsper, C. (2017). Adolescent mental health: The Public Health Response. In *International Handbook on Adolescent Health and Development* (pp. 93–114). Cham: Springer International Publishing.

Singleton, N., Gatward, R., & Meltzer, H. (1998). *Psychiatric morbidity among prisoners in England and Wales*. London: Stationery Office.

Talbot, J., & Riley, C. (2007). No One Knows: Offenders with learning difficulties and learning disabilities. *British Journal of Learning Disabilities*, *35*(3), 154–161. doi:10.1111/j.1468-3156.2007.00456.x

Tekin, A., Karadağ, H., Süleymanoğlu, M., Tekin, M., Kayran, Y., Alpak, G., & Şar, V. (2016). Prevalence and gender differences in symptomatology of posttraumatic stress disorder and depression among Iraqi Yazidis displaced into Turkey. *European Journal of Psychotraumatology*, *7*(1), 28556. doi:10.3402/ejpt.v7.28556

Teplin, L. A., Abram, K. M., McClelland, G. M., Dulcan, M. K., & Mericle, A. A. (2002). Psychiatric disorders in youth in juvenile detention. *Archives of General Psychiatry*, *59*(12), 1133–1143. doi:10.1001/archpsyc.59.12.1133

Timmons-Mitchell, J., Brown, C., Schulz, S. C., Webster, S. E., Underwood, L. A., & Semple, W. E. (1993). Comparing the mental health needs of female and male incarcerated juvenile delinquents. *Behavioral Sciences & the Law*, *15*(2), 195–202.

Turley, C., Payne, C., & Webster, S. (2013). *Enabling features of psychologically informed planned environments*. London: National Offender Management Service.

Underwood, L. A., & Washington, A. (2016). Mental illness and juvenile offenders. *International Journal of Environmental Research and Public Health*, *13*(2), 228. doi:10.3390/ijerph13020228

Van Damme, L., Colins, O. F., & Vanderplasschen, W. (2014). Gender differences in psychiatric disorders and clusters of self-esteem among detained adolescents. *Psychiatry Research*, *220*(3), 991–997. doi:10.1016/j.psychres.2014.10.012

Vizard, E. (2008). Emerging severe personality disorder in childhood. *Psychiatry*, *7*(9), 389–394. doi:10.1016/j.mppsy.2008.07.009

Vreugdenhil, C., Doreleijers, T. A., Vermeiren, R., Wouters, L. F., & Van Den Brink, W. (2004). Psychiatric disorders in a representative sample of incarcerated boys in the Netherlands. *Journal of the American Academy of Child & Adolescent Psychiatry*, *43*(1), 97–104. doi:10.1097/00004583-200401000-00019

Winsper, C., Ganapathy, R., Marwaha, S., Large, M., Birchwood, M., & Singh, S. P. (2013). A systematic review and meta-regression analysis of aggression during the First Episode of Psychosis. *Acta Psychiatrica Scandinavica*, *128*(6), 413–421. doi:10.1111/acps.12113

Winsper, C., Marwaha, S., Lereya, S. T., Thompson, A., Eyden, J., & Singh, S. P. (2015). Clinical and psychosocial outcomes of borderline personality disorder in childhood and adolescence: A systematic review. *Psychological Medicine*, *45*(11), 2237–2251. doi:10.1017/S0033291715000318

Winsper, C., Lereya, S. T., Marwaha, S., Thompson, A., Eyden, J., & Singh, S. P. (2016). The aetiological and psychopathological validity of borderline personality disorder in youth: A systematic review and meta-analysis. *Clinical Psychology Review*, *44*, 13–24. doi:10.1016/j.cpr.2015.12.001

Young, S., Sedgwick, O., Fridman, M., Gudjonsson, G., Hodgkins, P., Lantigua, M., & González, R. A. (2015). Co-morbid psychiatric disorders among incarcerated ADHD populations: A meta-analysis. *Psychological Medicine*, *45*(12), 2499–2510. doi:10.1017/S0033291715000598

Zhou, J., Cai, W., Chen, C., Wang, H., Zhang, S., Luo, Y., … Wang, X. (2012). Prevalence of mental disorders in the male juvenile detention centers of Hunan and Sichuan. *Zhong Nan da Xue Xue Bao. Yi Xue Ban = Journal of Central South University. Medical Sciences*, *37*(3), 217–221.