Individual and environmental contributors to psychological distress during imprisonment

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Abstract

People in prison bear a markedly higher burden of psychiatric morbidity compared with the general population. This study examined the extent to which individual and environmental factors contribute to poor mental health during imprisonment. Participants comprised 1296 randomly selected adults in 15 Belgian prisons. Psychological distress was more common in women than men and peaked during the early stages of imprisonment. In addition to having a history of mental disorder, low levels of perceived autonomy, safety, and social support were independently associated with distress. These findings underscore the importance of considering the prison environment in policies to improve the mental health of incarcerated individuals.

Keywords: prison, mental health, importation, deprivation

Mental disorders are a leading contributor to the global burden of disease (Ferrari et al., 2022) and disproportionately affect people who come into contact with the criminal justice system (Hensel et al., 2020). Epidemiological evidence consistently indicates a substantially higher prevalence of mental disorders and psychological distress among people in prison compared with the general adult population (e.g., Baranyi et al., 2019; Bronson and Berzofsky, 2017; Butler et al., 2006; Fovet et al., 2020). One in seven prisoners worldwide has a severe mental illness (Fazel and Seewald, 2012), with data suggesting an increase in their mental health needs over the past decade (Browne et al., 2023; Butler et al., 2022). Although women only comprise a small proportion (7%) of the global prison population (Fair and Walmsley, 2022), research shows that female prisoners bear a higher burden of psychiatric morbidity compared with their male peers (Binswanger et al., 2010; Browne et al., 2023; Svendsen et al., 2023; Tyler et al., 2019). This high prevalence is a cause for concern since men and women who experience poor mental health in prison are at increased risk of a confluence of adverse outcomes—including violence, victimisation, and self-harm while in custody (Favril et al., 2020b; Fazel et al., 2016) as well as reoffending and premature mortality after release into the community (Chang et al., 2015; Forsyth et al., 2018). Consequently, addressing the mental health needs of people in prison is likely to contribute to improvements in both public health and safety, which in turn will confer economic benefits for society at large (Favril and Dirkzwager, 2019; WHO, 2019). Knowledge on the determinants of mental health during imprisonment is key to inform service provision and correctional policy.

In contrast to the hundreds of prevalence studies that have been conducted to date (Fazel et al., 2016), comparatively little is known about what individual and environmental factors may contribute to poor mental health in prisoners. The extent to which mental health during imprisonment is influenced by prisoners' background characteristics or by aspects of the prison environment has been a matter of long-standing debate, which is essentially rooted within two main paradigms (Armour, 2012; Favril, 2021; Fedock, 2017).

On the one hand, the *importation model* posits that background characteristics and past experiences of people who enter prison determine their subsequent adaptation to imprisonment (Irwin and Cressey, 1962). Incarcerated individuals disproportionately come from disadvantaged backgrounds, whose life trajectories are commonly characterised by social exclusion, poverty, unstable housing, low educational attainment, and abuse (Friestad, 2010; Kouyoumdjian et al., 2016; Stewart et al., 2018). These drivers of criminal justice involvement overlap to a large degree with the social determinants of mental health (Caruso, 2017; Marmot, 2018; WHO, 2022). Indeed, the boundary between prison and the outside community appears to be particularly permeable to people who suffer from poor mental health (Moore et al., 2019; Stevens et al., 2015). From this perspective, then, the high prevalence of mental health conditions in prisoners is a reflection of the complex health needs and pre-existing morbidity that they import into prison—typically set against a backdrop of social disadvantage. Supporting this premise, research indicates that socioeconomic disadvantage, traumatic life events, and pre-prison morbidity are associated with mental health symptoms during imprisonment (Baidawi, 2016; Bowler et al., 2018; Dean and Korobanova, 2018; Edgemon and Clay-Warner, 2019; Goncalves et al., 2016; Liebling and Ludlow, 2016). These vulnerability factors not only increase the likelihood of offending and subsequent incarceration, but might also predispose people to experiencing poor mental health once incarcerated.

On the other hand, the *deprivation model* emphasises that adaptation to life in prison is shaped by the institutional context and related 'pains of imprisonment' (Sykes, 1958). Specifically, this model argues that poor mental health during imprisonment is mainly a consequence of the depriving and stressful environment in which people are detained. In support of this model, evidence shows that certain characteristics of the prison environment negatively affect prisoners' mental health, including a lack of purposeful activity, poor social support, low levels of autonomy and safety, in-prison victimisation, and difficulties with prison staff (Albertie et al., 2017; Edgemon and Clay-Warner, 2019; Goomany and Dickinson, 2015; Liebling and Ludlow, 2016; Schneider et al., 2011; Slotboom et al., 2011; Van Ginneken et al., 2019). These prison-related factors are also associated

with an increase in suicide risk (Favril, 2021; Favril et al., 2022). Furthermore, levels of distress appear to be highest during the initial months of incarceration (Walker et al., 2014), during which deprivations are often experienced most intensely. Remand prisoners have been shown to experience higher levels of distress than their convicted counterparts (Hassan et al., 2011), likely due to the sudden separation from family and friends, repeated court visits, and uncertainty regarding the future.

Taken together, the available evidence suggests that a range of individual and environmental factors are associated with poor mental health during imprisonment. Prisoners bring with them a high degree of imported vulnerability and the prison environment may induce, exacerbate, or mitigate distress. Importantly, the impact of the prison environment on individuals' mental health may vary depending on their background vulnerability. In particular, people with unstable and stressful living conditions prior to entering prison may experience health improvements during imprisonment as a result of daily structure, shelter, regular meals, and access to treatment (Bucerius et al., 2021). In contrast, many others will experience lower standards of living and care in prison than they were used to before coming to prison, and face additional stressors from the impact of imprisonment on their life outside prison. Although research supports the importance of differentiating in terms of individual vulnerability (Dirkzwager and Nieuwbeerta, 2018), there have been few empirical investigations that combine importation and deprivation perspectives to determine whether and how different prison conditions affect mental health outcomes during imprisonment. Notably, one longitudinal study showed that, after controlling for participants' background characteristics, an overall negative perception of the correctional climate predicted mental health symptoms over a six-month period (Goncalves et al., 2016). Other studies have yielded mixed results as to which *specific* characteristics of the prison environment may contribute to experiencing distress while incarcerated, independently of individual-level factors that may predispose one to poor mental health (Edgemon and Clay-Warner, 2019; Liebling and Ludlow, 2016; Slotboom et al., 2011; Van Ginneken et al., 2019).

Against this background, the current study aimed to examine which individual prisoner characteristics (conform the importation model) and aspects of the prison environment (conform the deprivation model) are associated with psychological distress among incarcerated men and women.

Methods

Setting

Belgium is a high-income country with 11.6 million inhabitants and a prison population of 10,960 in 2022, which corresponds to an incarceration rate of 94 per 100,000 individuals (Aebi et al., 2023). Prisons are spread across the country, half of which are located in the Flanders region of Belgium. With a proportion of 5%, women represent a numerical minority in Belgian prisons. A third (36%) of prisoners are held on remand (pre-trial detention) and 64% are sentenced, with an average length of imprisonment of 7 months (Aebi et al., 2023). Overcrowding is a persistent problem in Belgian prisons, which on average operate at 115% of their capacity. All prisons are publicly funded and the governance of prison health services rests with the justice ministry. Waiting lists for prison-based mental health care remain a major concern. In Flemish prisons, the resources currently available for mental health services are estimated to represent only a quarter of the amount required to meet the treatment needs of prisoners (Zorgnet-Icuro, 2019).

Participants and procedures

A detailed discussion of the sampling procedures and survey methods is outlined elsewhere (Favril and O'Connor, 2021; Favril et al., 2017). Briefly, eligible study participants were all men and women (aged 18 years and over) incarcerated across 15 Flemish prisons. During the study period (October 2015 to May 2016), a total of 3862 individuals (3636 men and 226 women) were incarcerated in the 15 selected prisons, of whom 1550 (1414 men and 136 women) were randomly selected by computer to participate in the study. Each individual in this random sample was personally (face-to-face) approached by the first author, a clinical psychologist independent of the prison system.

Following written informed consent, participants completed a paper-and-pencil questionnaire in Dutch, French, or English. Ethical approval for the study was granted by the Ethics Committee of Ghent University, Faculty of Law and Criminology.

A total of 1326 prisoners (1203 men and 123 women) participated in the study; a response rate (86%) that is comparable to the ~80% reported in similar large-scale prison studies (e.g., Binswanger et al., 2010; Browne et al., 2023; Favril et al., 2020a; Schneider et al., 2011; Van Ginneken et al., 2019). The sample accounts for 34% of all prisoners physically residing in the 15 prisons during the data collection period who were eligible to participate, and represents approximately 13% of the average daily population of prisoners in Belgium at that time.

Measures

Demographic and criminological information. Background data were collected on sex, age, and nationality. The survey also asked for relevant criminological variables, including prior incarceration (no/yes), current custodial status (remand *vs*. sentenced), time served (<1 month, 1–6 months, 6–12 months, 1–3 years, and >3 years), and offence type. The latter variable was recoded into non-violent (e.g., drug offences, theft, and fraud) and violent (e.g., murder, manslaughter, and rape) offences, which is consistent with previous research (Favril et al., 2020a). Additional questions inquired whether participants were currently employed in prison (no/yes) and their cell accommodation (single *vs*. shared cell).

Outcome variable. Psychological distress was assessed using the 12-item *General Health Questionnaire* (GHQ-12), a widely used and validated screening instrument which principally captures symptoms of depression and anxiety (Hewitt et al., 2011). Its sensitivity (0.70) and specificity (0.80) against standardised psychiatric interviews is acceptably high (Aalto et al., 2012). The instrument consists of 12 items (e.g., “Have you recently lost much sleep over worry?”) which prisoners were asked to rate on a four-point Likert scale according to the degree it was applicable during the past

four weeks of incarceration (Cronbach's α = .89). Survey instructions stated that, if prisoners were imprisoned for less than four weeks at the time of assessment, the questions related to the period since the beginning of their current incarceration. Items were scored using the binary method (0-0-1-1) which results in an overall score ranging between 0 and 12, with higher scores indicating more severe distress. This method is preferred when the GHQ-12 is used to screen for psychiatric morbidity in prisoners (Bowler et al., 2018; Hassan et al., 2011). In community samples, a GHQ-12 score of 4 or more is commonly used as the threshold to indicate a probable mental disorder (Fryers et al., 2004; Gisle et al., 2020). In prison populations, however, higher thresholds offer a superior balance of sensitivity and specificity. Based on previous research (Hassan et al., 2011), individuals with composite scores of 7 or more were considered to have experienced a high level of distress in the past four weeks while incarcerated.

Mental disorder and drug use. A self-reported history of a mental disorder diagnosis was assessed by asking participants "Have you ever been told by a mental health professional, such as a psychiatrist or psychologist, that you had one or more of the following mental disorders?" followed by a comprehensive list of diagnostic labels (including mood, anxiety, psychotic, personality, and substance use disorders). The wording of the question and choice of a self-report measure of lifetime psychiatric diagnoses is consistent with previous research in prisoners (Binswanger et al., 2010; Browne et al., 2023). Participants were further asked about whether they used any illicit drugs (including non-prescribed psychotropic medications such as benzodiazepines, but excluding tobacco and alcohol) during their current incarceration (Favril, 2023).

Quality of prison life. Prisoners' perceptions of their quality of life in prison were collected using the *Measuring the Quality of Prison Life* (MQPL) survey, a validated self-report instrument asking prisoners directly about the prison regime and relationships within prison (Liebling, 2004). Five prison dimensions were assessed through 23 statements which participants (dis)agreed with on a five-point

Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree): *personal autonomy* (e.g., "I have no control over my day-to-day life in here"), *physical safety* (e.g., "I feel safe from being injured, bullied, or threatened by other prisoners in here"), *decency* (e.g., "Prisoners spend too long locked up in their cells in this prison"), *outside contact* (e.g., "I am able to receive visits often enough in this prison"), and *staff relationships* (e.g., "Overall, I am treated fairly by staff in this prison"). Responses were recoded so that all items were scored in a positive direction, with lower scores indicating a more negative judgment of the particular prison dimension. Cronbach's α values were .64 for decency, .66 for safety, .67 for family contact, .49 for personal autonomy, and .84 for staff relationships. These values suggest some heterogeneity in the hypothesised constructs, which we address in the Discussion. All items and constructs are theoretically related to the overarching concept of 'quality of prison life' and are positively correlated to each other (*r* between .28 and .62).

Social support. Prisoners' self-perceived social support was assessed using the *Social Support Scale*, a seven-item instrument previously used in prison research (Jenkins et al., 2005; Rivlin et al., 2013). Each item (e.g., "There are people I know who can be relied on, no matter what happens") has three response options scored between 1 (not true) and 3 (certainly true). Overall scores ranged from 7 to 21, with higher scores suggesting higher levels of perceived social support (Cronbach's α = .91). Composite scores of 17 or less were used as an indicator of poor social support (Rivlin et al., 2013).

Analysis

The analytical sample comprised 1296 prisoners with complete GHQ data, as responses were missing for 30 (2.3%) of all 1326 participants. Participants with missing outcome data (*n* = 30) were more likely than those without (*n* = 1296) to be foreign nationals and awaiting trial, and less likely to report a mental disorder and drug use. No significant differences were found between both groups in terms of other variables listed in Table 1.

Contingency tables were used to describe sample characteristics and prevalence estimates. Bivariate associations were examined for all independent variables by comparing prisoners scoring above (≥7) and below (<7) the GHQ-12 threshold for high distress (using the χ^2-test for categorical variables and independent samples *t*-test for continuous variables). Next, three multivariate logistic regression analyses were conducted to estimate the independent contribution of individual and environmental factors to distress. The first model was limited to background variables (conform the importation model) and the second model only included prison-related variables (conform the deprivation model). To examine which individual and environmental variables are independently related to distress, all variables were simultaneously included in the third (combined) model. Bivariate and multivariate analyses were conducted for the overall sample as well as stratified by sex (men and women separately). Crude (OR) and adjusted (aORs) odds ratios are presented as estimates of the strength of bivariate and multivariate associations, respectively. A missing values analysis was conducted, showing that variables contained few missing cases (less than 5% for all individual items). This was deemed ignorable missingness, and listwise deletion was used to handle missing cases for all analyses. All tests were two-tailed and statistical significance was set at the 0.05 level.

Results

Sample characteristics

Of the 1296 participants whose data were included in the analysis, 1175 (90.7%) were men and 121 (9.3%) were women. Their mean age was 37.6 years (SD = 11.7, range 18–77) and 74.3% were of Belgian nationality. One-third (*n* = 442, 34.1%) were currently on remand (awaiting trial) with the other 854 (65.9%) participants being sentenced. A quarter (*n* = 332, 26.6%) of prisoners were charged with, or convicted of, a violent offence. More than half (*n* = 738, 56.9%) had a prior history of incarceration. At the time of assessment, 129 (10%) participants had been incarcerated for less than one month and 380 (29.3%) for more than three years. Approximately half (*n* = 606, 46.8%) of

prisoners reported a lifetime history of a mental disorder diagnosis. Additional characteristics of the sample are detailed in Table 1, stratified by level of distress.

Distress prevalence

Within a range from 0 to 12, the mean GHQ-12 score was 5.07 (SD = 3.78) in the total sample (Table 2), with significantly higher levels of distress among women (M = 6.22, SD = 3.84) compared to men (M = 4.95, SD = 3.75). Over one-third (37.3%, 95% CI 34.7–39.9) of all participants had a GHQ score of 7 or more, indicative of high distress. Women (52.1%, 95% CI 43.2–60.8) were significantly more likely than men (35.7%, 95% CI 33.1–38.5) to report high distress during the past month in prison (OR = 1.95, 95% CI 1.34–2.84). When adopting the community threshold score of 4 or more, 60.6% (95% CI 58.0–63.3) of participants were classified as having distress; again proportionally more women than men (72.7% vs. 59.4%; OR = 1.83, 95% CI 1.20–2.77). As a basis of comparison, GHQ-12 prevalence data among the general population in Belgium are listed in Table 2, based on a nationally representative sample of 7656 individuals aged 18 years and over (Gisle et al., 2020). Both in terms of mean and cut-off scores, psychological distress was approximately three times higher in prisoners relative to the general adult population.

Bivariate analyses

Results from bivariate analyses are shown in Table 1. In the overall sample (*n* = 1296), distress was positively associated with female sex (OR = 1.95, 95% CI 1.34–2.84) and remand status (OR = 1.60, 95% CI 1.26–2.02). Participants who had been previously incarcerated were less likely to experience distress than first-time prisoners (OR = 0.80, 95% CI 0.63–0.99). Those who were incarcerated for less than one month (OR = 1.83, 95% CI 1.21–2.75) up to six months (OR = 1.70, 95% CI 1.26–2.30) had higher odds of distress compared with the reference category (>3 years). A history of a mental disorder showed a positive relationship with distress (OR = 1.53, 95% CI 1.22–1.92). One-third (32.6%) of participants without a pre-existing diagnosis reported distress compared with 42.6% of

those with a diagnosis. Every variable related to the prison environment was significantly associated with distress—including cell occupancy, social support, working status in prison, and all five MQPL dimensions. In sex-stratified analyses, a similar pattern of associations was observed for men (*n* = 1175), except that a prior incarceration and single cell occupancy were no longer significant (see results in the supplemental file). Among women (*n* = 121), the only significant associations with distress were found for remand status and all five MQPL dimensions.

Multivariate analyses

Three multivariate regression analyses were conducted to identify independent associations with psychological distress (Table 3). In model 1, which was limited to individual variables, experiencing distress during imprisonment was associated with female sex, a history of mental disorder, and a prior incarceration ($\chi^2_{(7)} = 29.22$, $p < 0.001$; Nagelkerke $R^2 = 0.03$). Model 2, only including prison-related variables, showed that social support, autonomy, safety, and decency were significant predictors for distress ($\chi^2_{(13)} = 281.04$, $p < 0.001$; Nagelkerke $R^2 = 0.27$). Model 3 containing all predictor variables was statistically significant ($\chi^2_{(20)} = 313.67$, $p < 0.001$) and correctly classified 74% of cases, indicating that it was able to distinguish between prisoners with and without high distress given all the study variables. There was a good fit of the model to the data (Nagelkerke $R^2 = 0.35$). Female sex and prior incarceration did not retain statistical significance once environmental factors were controlled for in the final model. After adjusting for all individual and environmental predictor variables, six factors were independently associated with distress: nationality, time served, history of mental disorder, social support, autonomy, safety, and decency. Results indicate that MQPL dimensions made the greatest contribution to psychological distress, followed by time served in prison. All but one (nationality) of these variables were significantly related to distress when restricting the analyses to male participants (*n* = 1175), and among women (*n* = 121), only autonomy was independently associated with in-prison distress (see results in the supplemental file).

The difference between the multivariate and bivariate results warrants an inspection of correlations among the independent variables to identify possible indirect effects. It is noteworthy that prison employment is no longer significant in the multivariate models, while the bivariate analysis showed that people employed in prison were less likely to report distress (OR = 0.60, 95% CI 0.48–0.76). This may be partly explained by its significant correlation with time served (*r* = .27), history of mental disorder (*r* = -.08), and all five MQPL dimensions (*r* ranging from .06 for physical safety to .17 for decency). Similarly, single cell occupancy does not uniquely contribute to explaining distress, but is significantly associated with higher scores on personal autonomy (*r* = .09), outside contact (*r* = .15), staff relationships (*r* = .08), and decency (*r* = .15). The correlations between the different MQPL dimensions (range *r* = .28 to .62), and between the MQPL dimensions (except decency) and poor social support (range *r* = -.07 to .18), can explain why some of them did not retain statistical significance in the multivariate models.

Discussion

This study examined the prevalence and determinants of psychological distress during imprisonment in a random sample of 1296 prisoners. Over one-third (37%) of participants experienced high levels of distress in the past month, with a larger proportion of women (52%) than men (36%) doing so. This sex difference is consistent with previous research (Bronson and Berzofsky, 2017; Hassan et al., 2011; Liebling and Ludlow, 2016; Schneider et al., 2011), indicating that women disproportionately experience poor mental health while incarcerated. Relative to the general adult population in Belgium (Gisle et al., 2020), the prevalence of distress was found to be three times higher among people in prison (Table 2). These data confirm that incarcerated individuals comprise a particularly vulnerable population in terms of mental health (Favril and Dirkzwager, 2019; Fazel et al., 2016).

People who had been previously diagnosed with a mental disorder were more likely to report high distress while incarcerated. Similarly, in a prospective cohort study, mental illness on reception to prison was found to be a significant predictor of continued poor mental health during

imprisonment, although some improvements may be expected longitudinally (Hassan et al., 2011). Other studies have shown that a history of psychiatric treatment (as a proxy for mental disorders) increased the risk of in-prison distress among men (Goncalves et al., 2016) and women (Slotboom et al., 2011), suggesting that they may continue to experience mental health needs following incarceration. These findings are in keeping with the importation model, in that pre-prison morbidity affects subsequent adaptation to imprisonment. However, distress was not exclusive to prisoners with a mental disorder. One-third (33%) of participants without a diagnosis experienced high levels of distress during incarceration, compared to the 25% reported in the study by Hassan et al. (2011).

The early stages of custody were found to represent a period of heightened risk. People who were incarcerated for less than one month (up to 12 months) were more likely to experience high distress than those being incarcerated for longer periods of time. This finding aligns with longitudinal studies which found that levels of distress are highest upon reception to prison and generally stabilise or decrease over time (Dirkzwager and Nieuwbeerta, 2018; Walker et al., 2014). The initial phase of imprisonment may be particularly challenging because individuals are forced to adapt to a novel environment and cope with the deprivations of prison life—such as the loss of freedom and autonomy, separation from loved ones, and fear of violence (Douglas et al., 2009). Although there is longitudinal evidence for symptom improvement over time, few would argue that prisons are environments that are conducive to mental health (Nurse et al., 2003).

A principal finding of the current study is that environmental factors are clearly associated with prisoners' mental health, even after adjustment for their pre-existing vulnerability. Specifically, participants who experienced low levels of personal autonomy and physical safety in prison reported higher levels of distress. This adds to a growing body of evidence that these two domains of prison climate—autonomy and safety—are consistently related to mental health during incarceration (Liebling and Ludlow, 2016; Van Ginneken et al., 2019). Although life in prison is inherently characterised by restricted control and autonomy, individual variations in their perceived degree and quality appear to be of significance (Van der Kaap-Deeder et al., 2017). In a qualitative study, anxiety

and stress were common reactions among women who struggled to adapt to the loss of autonomy resulting from imprisonment (Douglas et al., 2009). Furthermore, the observed association between perceived safety and distress corroborates findings by Slotboom et al. (2011) and aligns with studies on the mental health consequences of in-prison victimisation (Albertie et al., 2017; Chassay and Kremer, 2022; Goomany and Dickinson, 2015). Experiences and fear of intimidation, bullying, and violence during imprisonment reflect intense stressors which can negatively affect health. An alternative explanation is that high levels of distress mean that people may not participate in activities, such as prison employment or education, which can explain more negative ratings of their quality of prison life. This is supported by the negative correlation between prison employment and the MQPL dimensions in the current study. Participation in employment means time out of cell, distraction, and social interactions with peers and staff, which can contribute to more positive perceptions of prison conditions and lower levels of distress. Taken together, the current data contribute to a greater understanding of the environmental determinants of mental health in prison (Goomany and Dickinson, 2015).

Furthermore, the current results indicate that the degree to which prisoners perceive social support to be available contributes to the likelihood of experiencing psychological distress during imprisonment. Disconnection from family and friends on the outside appears to be a consistent risk factor for poor mental health in prisoners (Albertie et al., 2017; Chassay and Kremer, 2022; Goomany and Dickinson, 2015). Expanding on the stress-buffering hypothesis, it can be argued that prisoners who experience strong social support are better able to cope with institutional stressors and deprivations (Thoits, 2011). Social support may be particularly salient to prisoners' mental health by virtue of the inherently isolated nature of incarceration. On the other hand, the quality of relationships with prison staff was not independently associated with distress once other variables were controlled for. However, note that a significant correlation existed between relationships with staff and poor social support, which may have absorbed some of the variation in the multivariate model. From a procedural justice perspective, it is presumed that staff treatment characterised by

fairness and respect relates positively to prisoners' mental wellbeing (Beijersbergen et al., 2014; Slotboom et al., 2011). A possible explanation for this non-significant finding, though consistent with a recent Dutch study (Van Ginneken et al., 2019), is that other prison climate dimensions may account for this relationship. For instance, positive interactions with staff can increase one's sense of autonomy, and experienced consistency in rule enforcement by prison officers can contribute to an environment perceived as safe (Van der Laan and Eichelsheim, 2013).

This study is one of the few to directly compare associations with distress between incarcerated men and women. Previous research has largely relied on male-only samples (Beijersbergen et al., 2014; Bowler et al., 2018; Edgemon and Clay-Warner, 2019) or did not stratify analyses by gender (Liebling and Ludlow, 2016; Schneider et al., 2011; Van Ginneken et al., 2019), which limits generalisability of findings to women. This represents an important evidence gap because women have been shown to quantitatively and qualitatively differ from men in terms of mental health needs (Tyler et al., 2019) and prison experience (Crewe et al., 2017). In the current study, only autonomy was found to be independently associated with distress among women. However, results for female prisoners should be interpreted with caution given the low statistical power owing to the relatively small sample size. This contributed to a multivariate model estimating effects with low precision and correspondingly wide confidence intervals, and it is possible there were associations that this study was underpowered to detect. Yet, bivariate associations only were significant for remand status and MQPL measures, but not for any of the individual-level factors under study. The overall high prevalence of imported vulnerability in female prisoners (Liebling and Ludlow, 2016) may limit its predictive value, while still contributing to high levels of distress. Future work that includes larger samples of women is needed to examine differential associations by sex.

Taken together, this research indicates that both importation and deprivation factors are associated with psychological distress during imprisonment. While the analytical approach used in this exploratory study did not allow for the empirical examination of possible interactions between individual characteristics and environmental conditions, it is still possible to reflect on this issue

theoretically. First, imported characteristics interact with the experience of imprisonment in the sense that pre-existent life and health circumstances form a basis of comparison for individual perceptions of circumstances in prison—a negative point of reference is more likely to result in improvement, and vice versa. Apart from a regression-to-the-mean effect, this can also be explained by effects of stable accommodation, regular meals, and access to treatment. Moreover, some people may feel safer from abuse or violence in prison than in the community (Bucerius et al., 2021). Second, certain individual characteristics may influence the course and experience of imprisonment. For example, poor mental and physical health may preclude some people from participating in activities and increase their vulnerability to in-prison victimisation. Low intellectual abilities or language barriers may further interfere with participation in prison programmes. In addition, people with a history of trauma may be more affected by an unsafe and hostile prison environment. Third, the composition of people on prison wings in terms of imported characteristics (e.g., offence type) may also be related to perceptions of the environment. For example, staff may treat people differently depending on their perceptions of risk or whether they know the prisoners on their wing well (Haggerty and Bucerius, 2021). Similarly, prisoners may also feel safer on a unit with peers with certain characteristics who have been incarcerated together for longer; for instance, Van Ginneken and Palmen (2023) found that composition of a unit in terms of criminal history of incarcerated individuals was significantly related to prison climate.

The extent to which prison experiences moderate the effects of imported vulnerabilities on mental health, and vice versa, is an important research question that was beyond the scope of this study. Future work should shift focus towards testing theory-driven hypotheses that make specific predictions about the interrelationship between importation and deprivation factors. Investigating potential causal mechanisms will advance our theoretical understanding of mental health in prison.

Strengths and limitations

Strengths of this study include the large and randomly selected sample from 15 prisons, in combination with a high response rate. This means that the data likely form a good cross-sectional representation of individual differences in distress, background factors, and experiences of deprivation, and allow for a comparison with scores from the general population.

Five methodological limitations should be borne in mind when interpreting the current findings. First, the cross-sectional study design precludes conclusions to be drawn about the directionality of observed associations—let alone causal inferences. Although cross-sectional data can yield insights into relationships between variables, the lack of temporal ordering limits their interpretation. Prospective studies are needed to clarify which factors *predict* distress during the course of imprisonment (Walker et al., 2014). Second, data were entirely based on self-report, which may be subject to recall bias and social desirability. For example, despite the anonymous nature of the survey, participants may have underreported sensitive information because of stigma (e.g., mental disorders and distress) or rated their prison experience (such as relationships with staff) overly positive due to fear of negative consequences. In addition, our outcome variable (distress) may also function as a lens through which deprivation is experienced and reported. That is, people who are mentally unwell may be more likely to rate their environment more negatively (i.e., mood-congruent) than their healthier peers (Blanchette and Richards, 2010; Everaert et al., 2017). Third, it is possible that non-participants (i.e., prisoners who were eligible to participate but declined to do so) differed from those who agreed to participate in terms of the outcome measure. Indeed, community-based studies suggest that non-participants exhibit higher levels of psychiatric morbidity than do participants (Haapea et al., 2008; Knudsen et al., 2010). However, since no information was collected on non-participants, it is uncertain whether any selection bias occurred. Fourth, no analyses were conducted at the prison level. Including institutional and macro-level factors in multilevel analyses might prove useful in further identifying sources of variation in mental health, such as security level and overcrowding (Edgemon and Clay-Warner, 2019). However, a study of 4538 Dutch prisoners suggests that most variance in distress is found at the individual rather than the prison

(unit) level (Van Ginneken et al., 2019). Fifth, the internal consistency of most MQPL dimensions was below normally considered acceptable values ($\alpha \geq .70$), which indicates heterogeneity in the measurement of the constructs. Combined with the correlation among the different scales, we cannot draw strong conclusions about the unique contributions of different aspects of the prison environment. Nevertheless, given its solid qualitative basis (Liebling, 2004; Liebling et al., 2012), we are confident that the combination of MQPL items together validly represents individuals' perceptions of the quality of prison life.

Implications

The current findings highlight the scale of psychological distress experienced during imprisonment. Although prevalent, mental health needs of prisoners frequently remain undetected and untreated (Senior et al., 2013). Standardised screening procedures to identify those in need for treatment is therefore a key component of prison mental health service provision (NICE, 2017). Given that prisoners are at heightened risk of experiencing poor mental health during the early stages of imprisonment, reception screening is considered to be best practice (Forrester et al., 2018) and several tools have been validated to identify those who require further treatment (Martin et al., 2013). Since distress fluctuates over time, screening should not be limited to the point of admission to prison but must be an ongoing and systematic process throughout the detention period. However, screening in itself will not improve outcomes unless it leads to effective care pathways. Mental health services need to be adequately resourced and linked with evidence-based interventions (Fazel et al., 2016) to address the high level of unmet need in prisoners (Jakobowitz et al., 2017; Tyler et al., 2019). Cognitive behavioural and mindfulness-based therapies currently have the most consistent evidence in reducing symptoms of depression and anxiety among prisoners, albeit with modest effects (Yoon et al., 2017). A recent randomised controlled trial further supports the (cost-)effectiveness of group interpersonal psychotherapy for prisoners with depression (Johnson et al., 2019). Trauma-informed care should also be considered, especially interventions which are tailored

to the unique needs of incarcerated women (Bartlett et al., 2015; Malik et al., 2023). At the same time, it should be recognised that the provision of mental health care in prisons remains challenging (Kolodziejczak and Sinclair, 2018). In addition to structural barriers such as limited resources and insufficient staffing, the prison environment is principally focused on security rather than being treatment-oriented. Interfacility transfers and short sentences may further impede health care engagement. Another consideration relates to the extensive and complex needs that prisoners present with, many of whom have comorbid conditions (Baranyi et al., 2022). Despite these challenges, incarceration presents a public health opportunity to address mental health needs of a vulnerable population that typically faces substantial barriers to accessing health care in the community (Favril and Dirkzwager, 2019; WHO, 2019).

In addition to mental health screening and treatment, the current study underscores the importance of targeting modifiable aspects of the prison environment in policies to improve mental health. Prison management can pursue this objective by creating environments that uphold a positive correctional climate and mitigate any detrimental effects of imprisonment. Based on the current findings, such strategies and changes to the prison regime should address aspects of safety, autonomy, and social support—which may additionally reduce prisoners' risk of suicide (Favril, 2021). Interventions to reduce institutional violence in the broad sense (e.g., intimidation, bullying, assault, and abuse) should be implemented in order to increase prisoners' sense of safety (Day et al., 2022), especially those aimed at vulnerable groups (including people with mental illness) who are more likely to be victimised in prison (Fazel et al., 2016). Prisoners should also be able to maintain meaningful contact with their family and friends on the outside through social visits or video calls, which can benefit their mental health (Chassay and Kremer, 2022). Settings-based strategies aiming to foster autonomy and choice have the ability to realise the 'health-promoting' potential of prisons, which advocates empowerment and agency (Woodall et al., 2014).

Closing remark

This study established that aspects of the prison environment are independently associated with psychological distress during imprisonment. However, like most other research on this topic, its (cross-sectional) sample exclusively comprised people who are incarcerated. As such, it is not possible to determine whether incarceration *in itself* impacts upon mental health. This important gap in knowledge on the health effects of imprisonment—positive or negative—is due to extant research not capturing detailed information on mental health conditions prior to incarceration, a lack of prospective studies assessing changes in distress before and during imprisonment, and the absence of an appropriate control group of non-incarcerated individuals to compare data with (Dirkzwager et al., 2021). Cohort studies with a population sampling frame, in which incarceration is treated as an exposure, are required to clarify the relationship between imprisonment and mental health.

Declaration of competing interest

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Table 1. Sample characteristics and bivariate associations with distress.

	Sample	Distress during imprisonment			
	(*n* = 1296)	GHQ <7 (*n* = 813)	GHQ ≥7 (*n* = 483)	Test statistic	OR (95% CI)
Female sex	121 (9.3)	58 (7.1)	63 (13.0)	12.50*	1.95 (1.34–2.84)
Age (<30 years)	890 (68.7)	562 (69.1)	328 (67.9)	0.21	0.95 (0.74–1.20)
Belgian nationality	958 (74.3)	591 (73.1)	367 (76.5)	1.83	1.20 (0.92–1.56)
History of mental disorder	606 (46.8)	348 (42.8)	258 (53.4)	13.71*	1.53 (1.22–1.92)
Illicit drug use	460 (35.5)	276 (33.9)	184 (38.1)	2.28	1.20 (0.95–1.51)
Violent offence	332 (26.6)	200 (25.4)	132 (28.4)	1.35	1.17 (0.90–1.51)
Prior incarceration	738 (56.9)	480 (59.0)	258 (53.4)	3.91*	0.80 (0.63–0.99)
Time served				20.64*	
<1 month	129 (10.0)	70 (8.6)	59 (12.2)		1.83 (1.21–2.75)
1–6 months	368 (28.4)	206 (25.4)	162 (33.5)		1.70 (1.26–2.30)
6–12 months	141 (10.9)	86 (10.6)	55 (11.4)		1.39 (0.93–2.07)
1–3 years	277 (21.4)	190 (23.4)	87 (18.0)		0.99 (0.71–1.39)
>3 years	380 (29.3)	260 (32.0)	120 (24.8)		1.00 (reference)
Remand status	442 (34.1)	245 (30.1)	197 (40.8)	15.30*	1.60 (1.26–2.02)
Single cell occupancy	638 (49.5)	418 (51.7)	220 (45.8)	4.19*	0.79 (0.63–0.99)
Poor social support	594 (46.3)	337 (42.0)	257 (53.3)	15.46*	1.58 (1.26–1.98)
Prison employment	708 (54.6)	482 (59.3)	226 (46.8)	19.09*	0.60 (0.48–0.76)
Personal autonomy	2.76 (0.76)	2.99 (0.71)	2.38 (0.69)	14.98*	0.29 (0.24–0.35)
Outside contact	2.99 (0.97)	3.16 (0.95)	2.70 (0.96)	8.36*	0.60 (0.53–0.68)
Staff relationships	2.85 (0.88)	3.01 (0.87)	2.59 (0.83)	8.52*	0.56 (0.49–0.65)
Physical safety	3.19 (0.82)	3.39 (0.76)	2.87 (0.80)	11.46*	0.43 (0.37–0.51)
Decency	2.64 (0.76)	2.82 (0.73)	2.34 (0.72)	11.25*	0.41 (0.35–0.49)

Note. Data are presented as *n* (%) or M (SD) as appropriate. OR = odds ratio, CI = confidence interval.

* $p < 0.05$ (χ^2-test for categorical variables and independent samples *t*-test for continuous variables).

Table 2. Psychological distress (GHQ-12) in prisoners and the general population.

	Men	Women	Combined
Prison population			
Cut-off 7 (%)	35.7 (33.1–38.5)	52.1 (43.2–60.8)	37.3 (34.7–39.9)
Cut-off 4 (%)	59.4 (56.6–62.2)	72.7 (64.2–79.9)	60.6 (58.0–63.3)
Mean (SD)	4.95 (3.75)	6.22 (3.84)	5.07 (3.78)
*General population**			
Cut-off 4 (%)	14.3 (12.6–15.9)	21.3 (19.6–23.0)	17.9 (16.7–19.1)
Mean (SD)	1.46 (2.58)	2.06 (2.98)	1.77 (2.81)

* Data from the 2018 Health Interview Study (Gisle et al., 2020).

Table 3. Multivariate analyses for distress during imprisonment.

	Model 1 (individual)		Model 2 (environmental)		Model 3 (combined)	
	B (SE)	aOR (95% CI)	B (SE)	aOR (95% CI)	B (SE)	aOR (95% CI)
Female sex	0.55 (0.20)	1.74 (1.17–2.58)*			0.46 (0.24)	1.59 (0.99–2.54)
Age (<30 years)	-0.04 (0.13)	0.97 (0.75–1.25)			0.18 (0.16)	1.20 (0.88–1.64)
Belgian nationality	0.04 (0.15)	1.04 (0.78–1.38)			0.35 (0.18)	1.42 (1.01–2.01)*
History of mental disorder	0.42 (0.13)	1.52 (1.17–1.97)*			0.39 (0.16)	1.47 (1.08–2.00)*
Illicit drug use	0.08 (0.14)	1.08 (0.83–1.42)			0.03 (0.16)	1.03 (0.75–1.41)
Violent offence	0.04 (0.14)	1.04 (0.78–1.38)			0.31 (0.18)	1.36 (0.95–1.93)
Prior incarceration	-0.30 (0.13)	0.74 (0.57–0.96)*			-0.24 (0.16)	0.79 (0.58–1.07)
Time served†						
<1 month			0.55 (0.28)	1.73 (0.99–3.02)	0.81 (0.32)	2.24 (1.20–4.17)*
1–6 months			0.47 (0.22)	1.60 (1.04–2.46)	0.69 (0.24)	1.98 (1.24–3.18)*
6–12 months			0.51 (0.25)	1.67 (1.02–2.72)	0.61 (0.27)	1.83 (1.09–3.09)*
1–3 years			0.09 (0.20)	1.09 (0.74–1.60)	0.14 (0.21)	1.16 (0.77–1.74)
Remand status			0.17 (0.18)	1.19 (0.84–1.67)	0.17 (0.19)	1.18 (0.82–1.71)
Single cell occupancy			0.24 (0.15)	1.27 (0.95–1.69)	0.19 (0.16)	1.21 (0.88–1.64)
Poor social support			0.32 (0.14)	1.37 (1.05–1.79)*	0.32 (0.14)	1.38 (1.04–1.84)*
Prison employment			-0.20 (0.14)	0.82 (0.62–1.08)	-0.18 (0.15)	0.84 (0.63–1.13)
Personal autonomy			-0.84 (0.11)	0.43 (0.35–0.54)*	-0.88 (0.12)	0.41 (0.33–0.52)*
Outside contact			-0.14 (0.08)	0.87 (0.75–1.01)	-0.12 (0.08)	0.89 (0.75–1.04)
Staff relationships			0.10 (0.10)	1.11 (0.90–1.36)	0.03 (0.11)	1.03 (0.83–1.27)
Physical safety			-0.46 (0.10)	0.63 (0.52–0.76)*	-0.39 (0.10)	0.68 (0.56–0.83)*
Decency			-0.39 (0.12)	0.68 (0.53–0.86)*	-0.44 (0.13)	0.65 (0.50–0.84)*

Note. aOR = odds ratio adjusted for all other factors in the multivariate model. * $p < 0.05$. † Reference category: >3 years.

Table S1. Bivariate associations with psychological distress, by sex.

	OR (95% CI)	
	Men (*n* = 1175)	Women (*n* = 121)
Age (<30 years)	0.95 (0.73–1.22)	0.80 (0.35–1.79)
Belgian nationality	1.16 (0.89–1.53)	0.95 (0.32–2.80)
History of mental disorder	**1.54 (1.21–1.96)**	1.07 (0.51–2.22)
Illicit drug use	1.22 (0.95–1.56)	1.11 (0.52–2.39)
Violent offence	1.15 (0.67–1.51)	1.11 (0.51–2.40)
Prior incarceration	0.85 (0.66–1.08)	0.71 (0.34–1.48)
Time served		
<1 month	**1.87 (1.21–2.87)**	1.26 (0.33–4.73)
1–6 months	**1.66 (1.21–2.27)**	1.68 (0.63–4.49)
6–12 months	1.42 (0.93–2.17)	0.94 (0.27–3.34)
1–3 years	0.99 (0.70–1.41)	0.85 (0.28–2.52)
>3 years	1.00 (reference)	1.00 (reference)
Remand status	**1.52 (1.18–1.95)**	**2.39 (1.12–5.10)**
Single cell occupancy	0.80 (0.63–1.02)	0.78 (0.38–1.62)
Poor social support	**1.60 (1.26–2.03)**	2.10 (0.97–4.55)
Prison employment	**0.61 (0.48–0.77)**	0.50 (0.24–1.05)
Personal autonomy	**0.31 (0.25–0.38)**	**0.17 (0.08–0.36)**
Outside contact	**0.60 (0.53–0.69)**	**0.65 (0.43–0.97)**
Staff relationships	**0.57 (0.49–0.66)**	**0.41 (0.25–0.68)**
Physical safety	**0.42 (0.36–0.50)**	**0.53 (0.32–0.88)**
Decency	**0.43 (0.36–0.51)**	**0.24 (0.13–0.44)**

Note. OR = odds ratio, CI = confidence interval. Significant associations ($p < 0.05$) are marked in bold.

Table S2. Multivariate analysis for psychological distress during imprisonment among men.

	B	SE	Wald	aOR (95% CI)	*p*
Age (<30 years)	0.233	0.168	1.921	1.26 (0.92–1.75)	0.166
Belgian nationality	0.330	0.181	3.316	1.39 (0.98–1.99)	0.069
History of mental disorder	0.395	0.164	5.756	1.48 (1.08–2.05)	0.016
Illicit drug use	0.033	0.171	0.038	1.03 (0.74–1.45)	0.846
Violent offence	0.349	0.192	3.310	1.42 (0.97–2.07)	0.069
Prior incarceration	-0.259	0.164	2.484	0.77 (0.56–1.07)	0.115
Time served*			11.445		0.022
<1 month	0.910	0.334	7.425	2.49 (1.29–4.78)	0.006
1–6 months	0.738	0.254	8.432	2.09 (1.27–3.44)	0.004
6–12 months	0.653	0.282	5.372	1.92 (1.11–3.34)	0.020
1–3 years	0.196	0.220	0.792	1.22 (0.79–1.87)	0.373
Remand status	0.081	0.201	0.162	1.08 (0.73–1.61)	0.687
Single cell occupancy	0.193	0.168	1.324	1.21 (0.87–1.69)	0.250
Poor social support	0.318	0.151	4.424	1.38 (1.02–1.85)	0.035
Prison employment	-0.145	0.157	0.855	0.87 (0.64–1.18)	0.355
Personal autonomy	-0.834	0.123	45.587	0.43 (0.34–0.55)	<0.001
Outside contact	-0.150	0.087	3.016	0.86 (0.73–1.02)	0.082
Staff relationships	0.037	0.115	0.105	1.04 (0.83–1.30)	0.746
Physical safety	-0.451	0.106	18.098	0.64 (0.52–0.78)	<0.001
Decency	-0.425	0.136	9.747	0.65 (0.50–0.85)	0.002

Note. aOR = odds ratio adjusted for all other factors in the multivariate model. * Reference category: >3 years.

Table S3. Multivariate analysis for psychological distress during imprisonment among women.

	B	SE	Wald	aOR (95% CI)	*p*
Age (<30 years)	-0.432	0.655	.435	0.65 (0.18–2.34)	0.510
Belgian nationality	1.060	0.890	1.417	2.89 (0.50–16.52)	0.234
History of mental disorder	0.125	0.644	0.038	1.13 (0.32–4.00)	0.846
Illicit drug use	-0.042	0.605	0.005	0.96 (0.29–3.14)	0.945
Violent offence	0.098	0.694	0.020	1.10 (0.28–4.30)	0.887
Prior incarceration	-0.238	0.724	0.109	0.79 (0.19–3.25)	0.742
Time served*			1.398		0.845
<1 month	-0.367	1.181	0.097	0.69 (0.07–7.02)	0.756
1–6 months	-0.017	0.888	0.000	0.98 (0.17–5.60)	0.985
6–12 months	-0.045	0.994	0.002	0.96 (0.14–6.71)	0.964
1–3 years	-0.771	0.869	0.788	0.46 (0.08–2.54)	0.375
Remand status	1.192	0.641	3.456	3.30 (0.94–11.58)	0.063
Single cell occupancy	-0.148	0.556	0.071	0.86 (0.29–2.56)	0.790
Poor social support	0.360	0.546	0.435	1.43 (0.49–4.18)	0.510
Prison employment	-0.353	0.612	0.333	0.70 (0.21–2.33)	0.564
Personal autonomy	-1.472	0.531	7.675	0.23 (0.08–0.65)	0.006
Outside contact	-0.135	0.339	0.159	0.87 (0.45–1.70)	0.690
Staff relationships	0.182	0.491	0.137	1.20 (0.46–3.14)	0.712
Physical safety	0.487	0.456	1.139	1.63 (0.67–3.98)	0.286
Decency	-0.915	0.579	2.495	0.40 (0.13–1.25)	0.114

Note. aOR = odds ratio adjusted for all other factors in the multivariate model. * Reference category: >3 years.