Objectives: This study aims to explore environmental and social risk factors for mental health issues using network analysis.
Methods: The study was conducted among a nationally representative sample of 2,701 habitants of Poland (51% of women). The measurements used were PHQ-9, UCLA, Neighbourhood Cohesion (Neighbourhood Belonging and Social Cohesion), REAT 2.0 (Quality of architecture conditions in neighbourhood area), distance and frequency use of blue, green, and urban public areas, Self-Rated Health, Physical Activity, urbanicity, size of place of residence per person and sociodemographic survey (age, education, income). We used a sparse Gaussian graphical model (GGM) with a graphical lasso with an EBICglasso estimator.
Results: We showed that urbanicity and physical environment were linked to mental health issues via neighbourhood cohesion and loneliness in the estimated network. Depression and anxiety were the nodes with the highest centrality strength and expected influence. Blue and green areas usage also had high centrality strength. Urbanicity played an important role as a bridge between the network nodes and had a high strength score. Physical health with blue and green areas frequency use had the highest closeness centrality score.
Conclusions: We revealed the connections among mental health, loneliness, social cohesion, and various environmental factors, particularly urbaicity. This will enhance our understanding of mental health risks and protective factors.
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Disclosure of Interest: None Declared

Suicidology and Suicide Prevention

O017

Moderating effects of the effectiveness of psychological interventions for suicide behavior and non-suicidal self-harm prevention in prison settings: a systematic review and meta-analysis

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Introduction: Suicide remains a major cause of death in prison (Status report on prison health in the WHO European Region 2022). In comparison with adults from general population, incarcerated people are at increased risk of presenting suicide-related behaviours (Fazel S, *et al.* Lancet Psychiatry 2017; 4 946–52). Although certain studies have identified effective programs to reduce suicide in prison context (Carter A, *et al.* EClinicalMedicine 2022; 44 101-266), there is little evidence examining the relationship between moderators of effectiveness at individual and contextual levels.
Objectives: This study aims to review empirical research on moderators of effectiveness of interventions in prison to reduce suicide, summarizing effect sizes across studies.
Methods: For this systematic review and meta-analysis, we searched EBSCOhost, ScienceDirect, PubMed and ProQuest for articles published from 1990 to 2024. Elegible studies included those evaluating the effect of psychological interventions, delivered to adults during incarceration, on suicidal prevention. The impact of moderators covering bibliometric features (i.e. year of publication, country), methodological features of the study (i.e. sample size, mean age of participants, sex ratio, study design, assessment type and tools), suicide-related features (main outcome, previous suicide history), and other relevant variables (prison type and location, type and length of sentence) as well as psychological traits (alcohol or drugs misuse or other treatments) were also included. This review was conducted in accordance with PRISMA guidelines. Meta-analyses using random-effect models were used to pool effect sizes for moderators' outcomes. The protocol was pre-registered with PROSPERO, CRD42024538967.
Results: Of 7728 articles retrieved, 18 studies (1695 participants, 330 [19.5%] females, 756 males [44.6%], and 609 [35.9%] unknown) met the inclusion criteria. Mean ages were 32·0 years, and ethnicity data was not sufficiently reported to be aggregated. Type of prison was mostly public sector and located in rural areas. Studies were frequently conducted in UK (n=8; 44%) and used varying study designs; most frequently pre-post with no control group (n=9; 50%). On average, prevention programs in prison context were effective in decreasing suicide deaths, suicidal ideation and self-harm (n=14; 78%).
Conclusions: Findings suggest that explanations for efficiency of psychological interventions to prevent suicide behaviour and self-harm in prison context, are moderated by physical environment, individual and psychosocial factors. Future research identifying what factors moderate treatment outcomes in suicide and self-harm prevention within prison environments could help elucidate associated factors of efficiency, helping develop potential therapeutic actions.

Disclosure of Interest: None Declared

Precision Psychiatry

O020

Combining structural MRI with Polygenic Risk Scores to disentangle unipolar and bipolar depression: a multimodal machine learning study

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Introduction: The differential diagnosis between Major Depressive Disorder (MDD) and Bipolar Disorder (BD) heavily relies on clinical observation. However, the two disorders often show similar symptomatologic profiles, leading to high misdiagnosis rates. Reliable biomarkers are therefore crucial to accurately discriminate between MDD and BD and provide better treatments. In this

regard, Machine Learning (ML) could represent a turning point in the field precision psychiatry, given its capability of making single-subject level predictions.
Objectives: In the present work, we aimed at providing a biomarker-based differential diagnosis between MDD and BD. To that end, we implemented: *i)* a structural MRI-based ML model; ii) a combined ML model, trained on MRI data and Polygenic Risk Scores (PRS) for different psychiatric disorders.
Methods: 168 depressed patients (73 MDD, 95 BD) were recruited at the IRCCS San Raffaele Scientific Institute. All patients underwent T1-weighted and Diffusion Tensor Imaging scans. Voxel-Based Morphometry (VBM) measures were extracted with Computational Anatomy Toolbox 12 (CAT12). Fractional Anisotropy (FA), Axial Diffusivity (AD), Mean Diffusivity (MD), and Radial Diffusivity (RD) were extracted with Tract-Based Spatial Statistics (TBSS). PRS for MDD, BD, Schizophrenia, Attention Deficit/Hyperactivity Disorder, Anorexia Nervosa and Autism were computed for a subsample of 155 patients (67 MDD; 88 BD) through Infinium PsychArray 24 BeadChip. We trained a Multiple Kernel Learning (MKL) algorithm with voxel-wise VBM and DTI features, subsequently combining them with the extracted PRS.
Results: The neuroimaging model achieved a Balanced Accuracy (BA) of 71.65% and an Area Under the Curve (AUC) of 0.77 (85.44% sensitivity, 57.86% specificity). All the features contributed to the prediction, with AD (63%) and MD (26%) as the most predictive. Adding PRS to neuroimaging resulted in an improved performance, reaching 74.18% BA and 0.77 AUC (90.97% sensitivity, 57.38% specificity). The most predictive features of the neuroimaging-PRS model were MD (56%) and AD (27%).
Conclusions: Structural MRI discriminated between MDD and BD, and adding PRS to neuroimaging features improved the performance of the ML model. These results highlight the predictive power of structural neuroimaging for the differential diagnosis between MDD and BD, as well as prompting multimodal classifiers as a promising tool in the context of precision psychiatry.

Disclosure of Interest: None Declared

Neuroimaging

O021

Neural Associations of Preclinical Alzheimer's Disease in Individuals with Low Anxiety Scores

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Introduction: Preclinical Alzheimer's disease (AD) is characterized by subtle cognitive changes that precede the onset of clinical symptoms. Neuropsychiatric symptoms such as anxiety have been increasingly recognized for their potential role in accelerating disease progression. Although various theories have been proposed, anxiety may exacerbate cognitive decline through mechanisms involving stress-induced neurochemical dysregulation, affecting brain regions vulnerable to AD pathology.
Objectives: This study examines the neural correlates of preclinical AD in individuals with low anxiety scores, employing MRI to explore potential early biomarkers and elucidate the complex role of anxiety in the progression of AD.
Methods: A total of 172 participants from the German Center for Neurodegenerative Diseases Longitudinal Cognitive Impairment and Dementia Study (DELCODE) were categorized into three groups: Healthy Controls (HC, n=59), Subjective Cognitive Decline (SCD, n=77), and Mild Cognitive Impairment (MCI, n=36). Anxiety levels were assessed using the Geriatric Anxiety Inventory-Short Form (GAI-SF), and neural responses to novelty were examined using 3-Tesla MRI. Statistical models were adjusted for relevant covariates, including age, education and study site. The differences of the three groups were analysed by one-way ANOVA contrasts and post-hoc analyses were performed with two sample t-tests.
Results: Significant neural differences were observed across groups, particularly in the precuneus, right angular gyrus, and right cerebellum exterior ($p < 0.001$, $p = 0.001$, and $p = 0.002$ respectively). The SCD group demonstrated greater activation in the right angular gyrus compared to HC ($p = 0.008$), while the MCI group exhibited more pronounced differences L-R precuneus, right cerebellum exterior, right angular gyrus, and right middle frontal gyrus regions indicating further cognitive decline ($p< 0.001$, $p< 0.001$, $p= 0.001$, $p= 0.017$ respectively).
Conclusions: This study identifies critical brain regions, with a particular emphasis on the right angular gyrus, associated with the early stages of AD in individuals with low anxiety scores. The activation in these areas likely correlates with an early inhibition deficit at the systems level in individuals with preclinical memory impairment. However, the role of anxiety in preclinical AD is complex and variable among individuals. Anxiety may serve as an early response to subtle cognitive changes in some, while in others, it might emerge as a consequence of these changes. Moreover, the relationship between anxiety and neural alterations in AD could be bidirectional, where anxiety both influences and is influenced by the disease's progression. These findings highlight the importance of considering anxiety when identifying early biomarkers for AD and suggest that targeted interventions addressing anxiety may help slow cognitive decline.

Disclosure of Interest: None Declared

Precision Psychiatry

O022

Toward precision psychiatry using HD-EEG and normative modeling

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