

Methods: We performed linkage disequilibrium score regression analyses (LDSC) and MiXeR to quantify the genetic overlap. A conditional/conjunctional false discovery rate (cond/conjFDR) approach was employed to detect shared genomic loci. Functional annotations, gene mapping and gene-based enrichment analyses were adopted to explore shared biological mechanisms. Web-based cell-type-specific enrichment analysis (WebCSEA) was employed to identify the cell types enriched for shared genes across tissues. Transcriptome analyses were conducted via S-PrediXcan to prioritize biologically plausible shared genes in relevant tissues.

Results: Despite weak or null genetic correlations identified by LDSC, MiXeR analyses demonstrated extensive moderate polygenic overlap (~400 to 800 shared variants) across all pairs of psychiatric and respiratory phenotypes. The cond/conjFDR approach detected a total of 378 unique loci jointly associated with severe psychiatric disorders and lung function or asthma, harboring a mix of concordant and antagonistic variants. Gene-based enrichment analyses applied to the 4,105 genes mapped to shared loci highlighted cell types including type II pneumocytes and macrophages in lung and monocytes in blood as well as biological processes involving the interferon (IFN) JAK-STAT pathway and natural killer cell activation, suggesting common immune mechanisms. Furthermore, when stratified by respiratory outcome, genes shared with asthma were enriched for immunity-related pathways, whereas genes shared with lung were enriched for non-immune mechanisms, indicating divergent shared etiology. A total of 22 shared genes identified by conjFDR approach were prioritized as biologically plausible in transcriptome analyses.

Conclusions: This study reveals the complicated shared genetic etiology between severe psychiatric disorders and lung function or asthma and implicates overlapping immune and non-immune mechanisms. Our findings suggest that individuals with severe psychiatric disorders should be screened for lung function decline and asthma in clinical settings.

Disclosure of Interest: None Declared

EPP019

AI-based diagnosis of depression and cardiovascular disease comorbidity based on big data

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Introduction: There is strong clinical evidence that patients with depression have high probabilities to present a cardiovascular disease and vice versa. Thus, it is important to accurately identify these patients in order to provide the optimal management of the comorbid conditions.

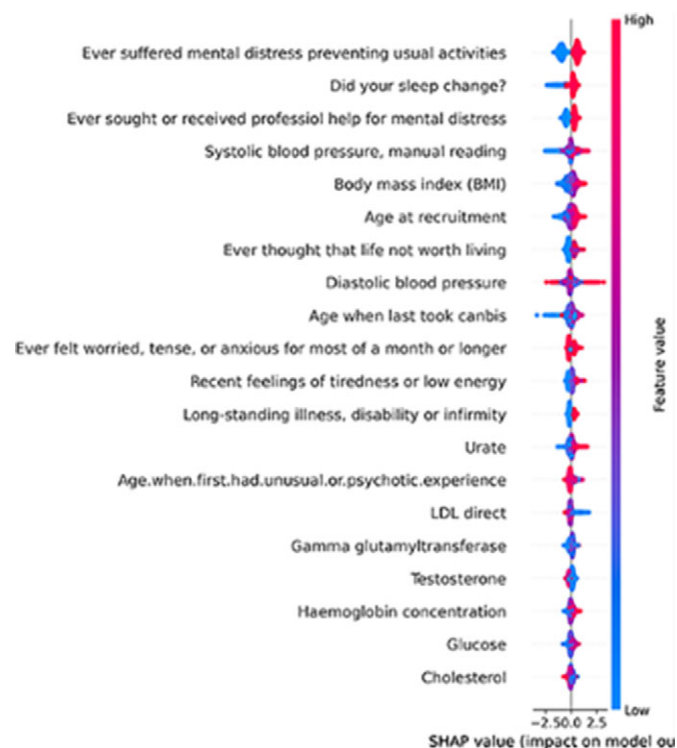
Objectives: To identify patients who have depression and cardiovascular disease using social and molecular biomarkers which are routinely collected in the clinical practice.

Methods: Data from 502,379 participants in the UK Biobank were utilized in this work. A subset of the participants has a mental

assessment using questionnaires about the presence of depression. CVD assessment was also available for the majority of the patients. In total, 126,033 participants had clinical assessment of both depression and CVD. From these, 8,925 patients had both comorbid conditions. An automated medical data curation tool described in a previous study was utilized to detect and mitigate data inconsistencies and elevate the input data integrity and usability. Hybrid boosting ensembles, including the XGBoost algorithm with a customized hybrid loss function was trained on the curated data, to reduce training and testing loss and to avoid overfitting effects. Dropout rates from deep learning theory were used in the hybrid loss function to further reduce biases during the decision-making process by controlling for the shape of the loss function. Random downsampling with replacement was also applied to match the control and target populations due to the increased class imbalance (ratio?) and with respect to the pre-defined set of confound factors. Additional classifiers including bagging classifiers were used for comparison purposes. The classification performance was assessed based on stratified 10-fold cross validation, where various metrics like the accuracy, sensitivity, specificity and area under the ROC curve scores were estimated. Advanced feature selection methods from coalition game theory, including the Shapley additive explanation (SHAP) exploratory analysis was utilized to identify predictors with positive or negative impact to have both the comorbid conditions. These explanations were based on the classification outcomes from specific training and testing instances.

Results: The XGBoost classifier had the best performance among all tested classifiers. The results were 0.85, 0.88, 0.81 and 0.92 for the accuracy, sensitivity, specificity and AUC, respectively. The figure 1, presents the explainability analysis for the selected biomarkers. As shown, there are simple social questions, but also some blood biomarkers which can be used for the identification of the patients with both the comorbid conditions of depression and CVD.

Image 1:



Conclusions: We developed an AI-based approach which can diagnose depression and CVD to patients in a cost effective way with accuracy of 85% and AUC equal to 0.92.

Disclosure of Interest: None Declared

EPP020

Relationship between BMI and affective disorders: results from a multicenter observational study

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Introduction: Patients suffering from severe mental disorders have a reduced life expectancy of approximately 10-25 years compared to the general population. This mortality gap is mainly due to physical comorbidities among which metabolic disorders play a significant role.

Objectives: In our study we used the Body Mass Index (BMI), an indicator of general health that can be easily calculated in daily clinical practice, to investigate how weight and the different psychopathological and psychosocial dimensions mutually influence each other in patients with mental disorders.

Methods: This naturalistic observational multicenter study was carried-out in 7 Italian university centers (Universities of Campania "L. Vanvitelli", Catania, Magna Graecia of Catanzaro, Cattolica del Sacro Cuore of Rome, Padova, Sapienza University of Rome, and Tor Vergata of Rome). Patients were recruited if they: 1) had diagnosis of bipolar disorder (BD) or major depressive disorder (MDD) according to DSM-5 criteria; 2) had an age between 18 and 65 years; 4) were in a stable phase of the disease (total score < 9 on the Hamilton Rating Scale for Depression and a score of ≤11 on the Young Mania Rating Scale). Affective temperaments were assessed with the Munster Temperament Evaluation of the Memphis, Pisa, Paris, and San Diego, impulsivity with the Barratt Impulsiveness Scale, and suicidal ideation with the Columbia Suicide Severity Rating Scale.

Results: A total of 598 patients were recruited, of which 60.9% affected by DB and 39.1% by MDD. Univariate analyzes revealed an association between higher BMI and male gender ($p<0.001$), BD diagnosis ($p<0.001$), high levels of impulsivity ($p<0.05$), presence of psychotic symptoms during the acute phases of illness ($p<0.05$), greater number of hospitalizations ($p<0.01$), cigarette smoking ($p<0.05$) and depressive temperament ($p<0.001$). Furthermore, patients treated with lithium ($p<0.05$), antiepileptics ($p<0.05$) and first-generation antipsychotics ($p<0.001$) had a significantly higher BMI compared to those not taking the aforementioned pharmacological treatments.

Conclusions: The results of our study highlight a strong link between BMI and some clinical outcomes in patients with affective disorders. The routinary assessment of these outcomes would be useful for the early identification of potential metabolic comorbidities as well as to identify patients at higher risk to develop a worse outcome.

Disclosure of Interest: None Declared

Cultural Psychiatry

EPP021

Predictors of Presence of and Search for Meaning in Life among Omani Students during the COVID-19 Pandemic: A Cross-sectional Study

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Introduction: While various fields and work areas have been impacted due to COVID-19, undergraduate students appear to have compounded stress. We sought to investigate the variables that predict meaning in life for Omani college students during the COVID-19 pandemic.

Objectives: This study investigated the personal and academic factors associated with the presence and search for meaning in life among college students in Oman.

Methods: A cross-sectional study was conducted in April 2021. A self-reported survey comprising the Meaning in Life Questionnaire (MLQ) and a sociodemographic questionnaire was completed by 970 students at the National University of Science and Technology in Oman. We used multiple linear regression to explore the independent predictors.

Results: Compared with engineering students, medical students were found to have a higher degree of both the presence of meaning in life as well as the search for meaning in life (p -value 0.001), and with each advancing academic year, the presence of meaning in life was found to be lower (p -value = 0.002). Students with chronic physical disease had a lower degree of presence of meaning in life and a lower degree of search for meaning in life (p = 0.001) compared with those without chronic disease. In addition, mental illness was associated with a lower degree of presence of meaning in life (p -value 0.001) and financial strain was associated with a lower degree of presence of meaning in life (p -value = 0.001).

Conclusions: In conclusion, no prior research demonstrated higher levels of meaning in life among medicine major students compared to those in engineering or pharmacy majors. Moreover, other academic, socio-economic, and health-related factors correlated with individuals' sense of meaning & search in life. Therefore, psychologists and psychiatrists should consider these diverse factors when designing interventions to support individuals in exploring and enhancing their meaning in life, considering their unique needs and contexts.

Disclosure of Interest: None Declared