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TITLE: Identification and characterization of the common genetic risk factors for chronic pain and psychopathology

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ABSTRACT:

Chronic pain patients often suffer from multiple pain disorders and other forms of psychopathology (particularly anxiety and depression). Changes in overlapping brain pathways and response to the same therapeutic interventions suggest shared psychological and physiological risk factors for multiple psychiatric and neurological disorders. A number of studies have likewise reported significant genetic correlations between chronic pain and several forms of psychopathology. Nevertheless, the underlying genetic architecture and specific risk variants are still largely unknown. Here, we aim to elucidate the genetic landscape and characterize molecular pathways that lie at the intersection of these disorders. Our analyses are organized into 4 stages: 1) A genome-wide association study (GWAS) on all available pain and psychological conditions in the UK Biobank cohort; 2) Phenotype factor analysis and genomic structural equation modeling (genomicSEM) using association statistics from stage 1; 3) GWAS on factors extracted from stage 2 to identify single nucleotide polymorphisms (SNPs) associated with genetic predisposition to multiple forms of chronic pain and psychopathology; and 4) Gene enrichment and pathway analysis of associated SNPs. We hope that our findings will reveal (a) whether one or more common factors underlie chronic pain and psychopathology; (b) whether these common factors are related to specific pain disorders and psychiatric diagnoses; (c) whether causes of pain related to brain and psychological health can be dissociated from those related to peripheral injury and tissue characteristics; and (d) genetic markers for nonspecific and tissue-specific risk factors for chronic pain, to be used for pain prognosis and counselling of at-risk patients.

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