Supplemental Information

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| Psychiatric Disorder  | Relationship with Chronic Pain |
| Schizophrenia spectrum disorders | Rates of chronic pain in those with schizophrenia found to be higher in some studies (veteran cohort, (1)), or are similar or lower compared to populations without schizophrenia (2–4).Some studies mention other schizophrenia spectrum disorders apart from schizophrenia (5). |
| Bipolar disorder | Having bipolar disorder often means also having conditions associated with chronic pain e.g. type 2 diabetes & (especially) migraine (6–9).Those with bipolar disorder also tend to also have chronic pain in general, at higher rates than people without bipolar disorder (8,10,11).It is not known if chronic pain-bipolar relationship is different in type 1 vs type 2 BPD, except some studies of migraine specifically where this is more prevalent with bipolar 2 vs in a mixed bipolar (1 and 2) sample (12). |
| Obsessive-compulsive and related disorders | Women with fibromyalgia are 4-5x more likely to have OCD than those without (13), and the most prevalent comorbid physical condition in cohort with OCD was chronic pain (14). In a cohort of older adults with OCD, higher pain intensity was reported but pain prevalence was similar to general population (~20%) (15).Research on OCD-chronic pain overlap in general seems sparse (16).With related disorders such as body dysmorphic disorder, excoriation disorder, hoarding disorder, trichotillomania, fewer studies on the overlap with pain exist. With trichotillomania and excoriation (skin-picking), there is some question as to whether pain perception varies compared to non-OCRD populations (but should be noted many studies are of induced, acute pain) (17). Those with hoarding disorder more likely to report chronic pain (18,19). |
| Neurodevelopmental disorders other than ADHD | Autism spectrum disorder: autistic people may have pain perception differences (again, this is not necessarily chronic pain). Some studies show a lot of chronic pain experienced by autistic people is GI related (20–23).Hypermobility spectrum disorders (often associated with chronic pain) have a higher prevalence in autistic people (24,25).Intellectual disability (ID) can often be a key symptom in mendelian pain/chronic pain disorders (e.g. Charcot-Marie Tooth disease (26)) but in terms of general complex-trait chronic pain those with ID might be at higher risk of developing painful conditions in some studies, but in other studies prevalence matches chronic pain prevalence in the general population (27–31).There are few studies examining other neurodevelopmental disorders and chronic pain relationships, e.g., in childhood onset fluency disorder (stuttering), specific learning disorder(s), motor disorder, tic disorder, and stereotypic movement disorder. |
| Feeding and eating disorders | Disordered eating generally in adolescents common in chronic pain cohorts (32,33). Case reports of patients with pica note chronic pain in stomach or mouth being directly linked to consumption of e.g. brick pieces, rather than general / unexplained chronic pain associated with having pica (34,35). In children with sickle cell, a condition involving significant and chronic pain, higher risk for pica is observed (36,37). Chronic pain can also result from rumination disorder in adolescents (38).There is some evidence of differences in pain perception in people with anorexia nervosa, and of differences in general perception of sensation (39). Some studies show increased rates of AN in chronic pain cohorts (40), or strong relationships between chronic pain and developing AN (41).Some studies find endometriosis to be associated with lower BMI (42–45) and therefore there may be relationship between AN and this chronic pain conditionSome studies show an elevated pain threshold - but this is acute pain (and in a cohort considered to be recovered from BN) (46). There is also evidence of acute pain processing disturbances (47). Abdominal pain is common in BN, but may not be strictly chronic (48). Other studies show increased BN in those with migraine, irritable bowel syndrome, and chronic facial pain (reviewed by (49)), and some studies show slight increase in BN in adolescents with chronic pain (33)– though this increase is much smaller compared to adolescents with AN.Eating behaviour is “frequently disturbed” in adolescents with chronic pain - this could amount to ARFID (49), in addition some people with ARFID present with longstanding abdominal pain (50).Binge-eating disorder has also been associated with chronic pain (51–53). |
| Anxiety disorders | Those with generalized anxiety disorder are twice as likely to have chronic pain (54) and those with chronic pain are more likely to have comorbid anxiety disorder of any kind (55–57).Panic disorder and social anxiety disorder are also associated with chronic pain & chronic pain conditions/ conditions associated with chronic pain (such as cancer, arthritis and diabetes) in some studies (13). |
| Depressive disorders | The relationship between understudied depressive disorders e.g. premenstrual dysphoric disorder (PMDD) and chronic pain is unclear - pain variation in menstrual cycle has been previously documented (both in terms of acute/pain sensitivity and worsening symptoms in chronic pain conditions), but there are not many studies of PMDD-chronic pain relationship in particular, though pain is noted (back pain, breast pain, though not chronic) as part of PMDD symptoms, (58–60). |
| Substance-related/ addictive disorders  | 8-12% of people with chronic pain and prescribed opioids go on to develop opioid use disorder (OUD) in the USA vs 0.6% in the general population (61,62).Other studies find high rates (60%+) of OUD in chronic pain cohorts (63,64).Large proportions of some cohorts with alcohol use disorder (AUD) are using alcohol to self-medicate chronic pain (65), and increased prevalence of AUD has been found in chronic pain cohorts (66). |

Supplementary Table 1: Relationships between chronic pain and DMS-5 psychiatric diagnoses: further detail.

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