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Comorbidity of Mental Disorders and Chronic Pain: Chronology of Onset in Adolescents of a National Representative Cohort

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Abstract: This study sought to estimate 1) the prevalence of the co-occurrence of, 2) the association between, and 3) the sequence of onset of chronic pain and mental disorders in adolescents. We used weighted data (N = 6,483) from the National Comorbidity Survey Replication Adolescent Supplement (participants' age, 13–18 years). Lifetime chronic pain was assessed by adolescent self-report; lifetime DSM-IV mental disorders were assessed by the WHO Composite International Diagnostic Interview, complemented by parent report. Among the participants in the study, 1,600 of 6,476 (25.93%) had experienced any type of chronic pain and any mental disorder in their lifetime. All types of pain were related to mental disorders. The most substantial temporal associations were those with onset of mental disorders preceding onset of chronic pain, including those between affective disorders and headaches and any chronic pain; between anxiety disorders and chronic back/neck pain, headaches, and any chronic pain; between behavior disorders and headaches and any chronic pain; and between any mental disorder and chronic back/neck pain, headaches, and any chronic pain.

***Perspective:** Findings indicate that affective, anxiety, and behavior disorders are early risk factors of chronic pain, thereby highlighting the relevance of child mental disorders for pain medicine. To improve prevention and interventions for chronic pain, integrative care should be considered.*

***Key words:** Children, co-occurrence, multimorbidity, psychosomatic, somatoform.*

Pain is a major public health challenge in terms of epidemiology, pain management, and health care costs, affecting people across life and starting as early as during childhood.[45] Different types of pain have been described[64]; chronic pain, with various definitions,[1] has received considerable attention given its impact on quality of life, well-being, functioning, employment, and use of health care and its enormous economic burden.[7,10,66] Estimates of the prevalence of chronic pain in children and adolescents vary substantially. A recent systematic review[57] examining different types of chronic and recurrent pain and including studies focusing on different reporting periods up to 12 months revealed median prevalence estimates ranging from 11 to 38%. The economic impact of chronic pain in adolescence is significant.[91]

Mental disorders are also highly prevalent in children and adolescents,[9,19,28,29,48,82] with enormous

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implications for health-related quality of life[84] and health economy.[36] The *Lancet* Series on Global Mental Health and health action plans by the American Academy of Pediatrics previously highlighted the urgent need to integrate mental health into all aspects of health research and health care delivery.[33,78] Moreover, cross-fertilizing interactions between specialists caring for patients with chronic pain and mental disorders have recently been claimed.[27]

The comorbidity of chronic pain with mental disorders has been studied predominantly in adults. A large body of research in clinical samples and the general population has consistently documented increased rates of psychopathology in adults with pain conditions, including depressive disorders, anxiety disorders, somatoform disorders, substance use disorders, and personality disorders as the most common diagnostic categories.[3-5,24,38,67,86,93,99] Whereas prevalence rates of comorbid pain and psychiatric symptoms based on treatment seeking clinical samples might be overestimated because of biased sample selection,[3,41,67] in the general population, prevalence estimates of mental disorders among persons with chronic pain conditions range between 6.0 and 28.6% for affective disorders,[3,38,67,86,93,99] between 2.3 and 35.1% for anxiety disorders,[38,67,86,99] and between 2.5 and 5.8% for substance use disorders.[38,86]

The few epidemiological studies investigating the prevalence of personality disorders among persons with various pain conditions reported estimates ranging from .8 to 27.3%.[4,68] Not only 1 specific type but a wide range of different types of chronic pain are associated with increased rates of psychopathology. Results from the World Mental Health Surveys and the National Comorbidity Survey Replication indicate that mental disorders are more common among persons with back or neck pain than among persons without.[23,40,96] Hamelsky and Lipton[41] summarized in their review that large population-based studies demonstrate strong relationships between migraine and mental disorders. Kalaydjian and Merikangas[47] compared 12-month prevalence rates of mental disorders between adults with severe headaches or migraine and those without and found estimates of 14.61% vs 5.42% for major depression, 5.59% vs 1.55% for panic disorder, and 5.74% vs 1.97% for generalized anxiety disorder. Several studies have suggested that persons with coexisting chronic pain and mental disorders have poorer treatment outcomes and increased pain intensity and disability.[24]

There is little knowledge on the comorbidity of chronic pain and mental disorders in children and adolescents. This is surprising given the developmental trajectory of both conditions.[53,56,60,70,80,83,100] There is particular evidence of the relationship between child/adolescent chronic pain and adult psychiatric symptoms[15,30,43,60,88] and, vice versa, the relationship between child/adolescent mental disorders and chronic pain in adulthood.[62,87] Some studies support a relationship between recurrent abdominal pain and mental disorders or symptoms in children and adolescents.[25,26] However, data on the co-occurrence of and (temporal) association between chronic back or neck pain or headaches and mental disorders are lacking.

Most of the previous findings on the comorbidity of chronic pain and mental disorders have only limited implications regarding the causality of the relationships between chronic pain and mental disorders. Therefore, it has been suggested to focus on the time of onset of chronic pain and mental disorders, respectively, thereby allowing insight into the temporal course of these conditions,[23] which is of crucial importance to elucidate the lifetime perspective of chronic pain conditions and mental disorders.

The main objectives of this study were to estimate in a representative sample of adolescents of a cross-sectional national survey 1) the prevalence of the co-occurrence of lifetime chronic pain and mental disorders, 2) the association between lifetime chronic pain and mental disorders, and 3) the temporal sequence of onset of lifetime chronic pain and mental disorders.

Methods

Study Sample

We used data from the National Comorbidity Survey Replication Adolescent Supplement (NCS-A), a nationally representative face-to-face survey of 10,148 U.S. adolescents (aged 13–18 years) that was carried out in a dual-frame design between February 2001 and January 2004.[49,50,54] The NCS-A has previously been described in detail.[49,50,69] For further information on the NCS-A, see http://www.icpsr.umich.edu/icpsrweb/ICPSR/studies/28581/version/2. The present work focuses on a subset of 6,483 of 10,123 adolescents in school at the time of the survey for which interviews as well as parent questionnaires (long versions) were available. We used poststratification weighting data, as described previously,[50] to correct minor discrepancies in distributions of school and/or sociodemographic characteristics between the sample and the population. The human subjects committees of both Harvard Medical School and the University of Michigan approved the procedures, and adolescents and parents provided written informed consent.

Diagnostic Assessment

Mental Disorders

Lifetime mental disorders were surveyed with the World Health Organization Composite International Diagnostic Interview (CIDI) version 3.0, adjusted for and conducted with the adolescents.[54,69] The CIDI is a structured clinical interview assessing mental disorder classes and subcategories according to the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (DSM-IV) and the World Health Organization International Classification of Disease, including affective disorders, anxiety disorders, behavior disorders, substance use disorders, and eating disorders. Quality of the interview was ensured by several organizational and operational measures, including intensive training and supervision of the lay