NIH Public Access
Author Manuscript
Cephalalgia. Author manuscript; available in PMC 2013 June 25.

Published in final edited form as:
Cephalalgia. 2012 November ; 32(15): 1116–1122. doi:10.1177/0333102412460776.

Psychiatric comorbidity in pediatric chronic daily headache

Shalonda K Slater[1,2], **Susmita M Kashikar-Zuck**[1,2], **Janelle R Allen**[1], **Susan L LeCates**[3], **Marielle A Kabbouche**[2,3], **Hope L O'Brien**[2,3], **Andrew D Hershey**[2,3], and **Scott W Powers**[1,2]

[1]Division of Behavioral Medicine and Clinical Psychology, Cincinnati Children's Hospital Medical Center, USA

[2]Department of Pediatrics, University of Cincinnati, College of Medicine, USA

[3]Division of Neurology, Cincinnati Children's Hospital Medical Center, USA

Abstract

Objectives—The objectives of this study were to assess comorbid psychiatric diagnoses in youth with chronic daily headache (CDH) and to examine relationships between psychiatric status and CDH symptom severity, as well as headache-related disability.

Methods—Standardized psychiatric interviews (Kiddie Schedule for Affective Disorders and Schizophrenia, KSADS) were conducted with 169 youth ages 10–17 diagnosed with CDH. Participants provided prospective reports of headache frequency with a daily headache diary and completed measures of symptom severity, headache-related disability (PedMIDAS) and quality of life (PedsQL).

Results—Results showed that 29.6% of CDH patients met criteria for at least one current psychiatric diagnosis, and 34.9% met criteria for at least one lifetime psychiatric diagnosis. No significant relationship between psychiatric status and headache frequency, duration, or severity was found. However, children with at least one lifetime psychiatric diagnosis had greater functional disability and poorer quality of life than those without a psychiatric diagnosis.

Discussion—Contrary to research in adults with chronic headaches, most youth with CDH did not appear to be at an elevated risk for comorbid psychiatric diagnosis. However, patients with a comorbid psychiatric diagnosis were found to have higher levels of headache-related disability and poorer quality of life. Implications for treatment are discussed.

Keywords

Chronic daily headache; pediatric; psychiatric comorbidity; emotional adjustment; headache-related disability; quality of life

Chronic daily headache (CDH), defined as 15 or more headaches per month, is a particularly debilitating form of recurrent headache that affects millions of children and adolescents (1). CDH represents a large proportion of new referrals to specialty headache centers in pediatric hospitals (2) and is associated with increased functional disability and impaired quality of life (3). In fact, children with recurrent headaches have been found to have lower quality of life than children with chronic illnesses such as asthma and diabetes (3,4). Due to their

© International Headache Society 2012

Corresponding author: Shalonda K Slater, Division of Behavioral Medicine and Clinical Psychology, Cincinnati Children's Hospital Medical Center, MLC #3015, 3333 Burnet Ave., Cincinnati, OH 45229-3039, USA. Shalonda.Slater@cchmc.org.

Conflict of interest
None declared.

NIH-PA Author Manuscript
NIH-PA Author Manuscript
NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript

chronic headaches, children with CDH often miss school, social and family activities (5). Functional disability in children with recurrent headache has also been shown to be a risk factor for psychiatric conditions such as depression (6). Comorbid psychiatric symptoms may have implications for the multidisciplinary treatment of CDH.

In the adult headache literature, a strong association between psychiatric comorbidity and chronic headache has been consistently documented, with most studies focusing specifically on patients with migraine headache. Adults with chronic headaches have significantly higher rates of depression and anxiety with odds ratios ranging from 2.2 to 5.3 (7-11). The presence of comorbid psychiatric diagnosis is thought to complicate treatment outcomes in headache (12,13) because improvements in one outcome (such as headache frequency) may not be accompanied by improvement in other outcomes (such as headache-related disability) or vice versa. This makes it necessary to target management of mood symptoms and reduction of pain-related disability as part of treatment, in addition to headache prevention efforts. While research in the area of adult headache has made great strides, little is known about the prevalence of psychiatric comorbidity in children with chronic headache conditions and implications for their clinical management.

Some researchers have suggested that children with headaches are at increased risk for psychological adjustment problems, including symptoms of anxiety and depression (14,15). However, many of these studies have used self-report questionnaires of psychological symptoms as opposed to psychiatric interviews to determine the presence of discrete Axis I psychiatric disorders (16). A single published study of a large sample of school-children in Taiwan that did utilize standardized interviews indicated that nearly half (47%) of the sample of 122 children (out of more than 7000 children) who reported chronic headaches had one or more psychiatric disorders, primarily mood or anxiety disorders (17). However, this study did not assess lifetime psychiatric diagnoses and found no relationship between headache frequency or duration and psychiatric comorbidity. Cultural differences or varying criteria for headache and psychiatric diagnoses may play a role because these findings of high comorbidities are by no means consistent across studies. A systematic review of the literature on anxiety and depression in children and adolescents with migraine (18) reported that studies on the comorbidity of headaches, anxiety and depression in children were inconclusive, and more rigorous research with a clear definition of diagnostic criteria for headache and psychiatric conditions was needed.

The main reason for variability in estimates of the prevalence of psychopathology in the pediatric headache population is likely to be the differing diagnostic criteria used (9,19) both for the type of headache condition and the diagnosis of psychiatric disorder. In addition, community-based studies may not accurately reflect the characteristics of patients who present to specialty headache clinics for treatment. This study attempts to fill a major gap in the literature by systematic classification of both CDH diagnosis based on current International Headache Society 2nd Edition (2004) criteria, and psychiatric comorbidity based on the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM IV) (16) criteria, in a clinically referred sample of patients seen in a specialty headache center in a pediatric hospital. To gain a more comprehensive perspective, we further characterized the relationship between their presenting symptoms and headache-related disability and quality of life. Hence, the primary objectives of this study were to 1) assess comorbid anxiety, mood and behavioral disorders in children and adolescents with CDH using standardized diagnostic criteria and 2) examine relationships between psychiatric status and CDH symptom severity, headache-related disability and quality of life. Based on the prior literature, we hypothesized that we would find increased prevalence of psychiatric comorbidity (mood and anxiety disorders) in youth with CDH, and that the presence of

NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript

comorbid psychiatric diagnoses would be associated with greater CDH symptom severity and headache-related disability and lower quality of life.

Methods

Participants

The current study was a part of the screening process for an ongoing treatment study evaluating the effectiveness of drug and non-drug treatment of pediatric CDH. Study participants were recruited from a specialty headache center in a large tertiary-care pediatric hospital and included 169 children and adolescents with CDH. Inclusion criteria were: 1) diagnosis of CDH defined as 15 or more headache days per month (28 days) measured by a prospective daily headache diary, in accordance with the criteria for CDH based on the International Classification of Headache Disorders-II (ICHD-II) criteria of the International Headache Society (ll participants were also diagnosed with chronic migraine headache by a pediatric neurologist) and 2) between the ages of 10 and 17. Exclusion criteria included a diagnosis of any other chronic pain condition or documented developmental delay.

Procedure

Study neurologists (AH, HO and MK) identified eligible patients with chronic migraine who met ICHD-II criteria for CDH at the initial neurology visit, and informed families about the study. If patients were interested in learning more about the study, the neurologist obtained verbal consent from families for a research coordinator to approach the family to describe the study and request participation. The research coordinator obtained written informed consent from parents of patients and written assent from children and adolescents who agreed to participate. The study was approved by the hospital's Institutional Review Board.

Families were given daily headache diaries for the children to complete for one month before their study visit. At the study visit, diaries were first reviewed, and documentation of 15 or more headaches per month was confirmed. Participants and their parents then completed self- and parent-report questionnaires, and study staff were present to ensure understanding of all items and answer any questions. Next, a trained doctoral level psychology fellow or licensed psychologist administered the psychiatric interview. All interviewers were thoroughly trained in the standardized administration and scoring of the Kiddie-Schedule for Affective Disorders and Schizophrenia Present and Lifetime Version (K-SADS-PL) by a senior psychologist co-investigator (SMKZ).

Measures

Background information form—Parents of adolescents provided information regarding demographic characteristics (ethnicity, socioeconomic status, parental educational levels and occupational background).

Prospective headache diary—This diary included items assessing 1) headache frequency — indicating whether they had a headache each day, 2) headache intensity on a 0–10 numeric pain rating scale and 3) headache duration in hours. A prospective daily diary rating is preferable to asking subjects for a pain rating for the past month because of potential for recall bias. Numeric pain rating scales are commonly used in treatment studies and are appropriate for the age range of participants in this study (20). Data from the diaries allowed for classification of CDH criteria of headaches on 15 or more days per month according to the ICHD-II criteria, as well as headache intensity and duration.

K-SADS-PL—The K-SADS-PL is a semi-structured psychiatric interview designed to assess psychopathology in children and adolescents (16). This DSM-IV-referenced

NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript

structured interview was utilized to assess both current and lifetime history of Axis I psychiatric diagnoses. The K-SADS-PL was administered to the parent and child together and separately as needed. Scoring is based on clinician judgment of the presence and severity of symptoms based on parent and child report. The instrument has strong test-retest and inter-rater reliability as well as concurrent validity (16). The current study focused on mood, anxiety and behavioral disorders, although all current and lifetime psychiatric diagnoses were evaluated.

Pediatric Migraine Disability Assessment (PedMIDAS)—The PedMIDAS is a measure that evaluates the impact of headaches on school, home, play and social activities in the past 90 days. Six developmentally appropriate questions constitute the PedMIDAS, and they are designed to be answered by the children and adolescents in consultation with their parents. The PedMIDAS uses a total score grading scale of none (0–10), mild (11–30), moderate (31–50) and severe (>50). The measure shows excellent internal consistency and test-retest reliability, and has been shown to be sensitive to intervention effects (4). The total PedMIDAS score was used as an indicator of headache-related disability.

Health-Related Quality of Life Measurement (HRQOL Child/Teen Report-Generic Core Scales)—The Pediatric Quality of Life Inventory, Version 4.0 (PedsQL 4.0 ™) is a measure that is commonly used for comprehensive assessment of the impact of chronic illness, including in children with headaches (21). The PedsQL™ 4.0 has been validated in a range of chronic health conditions in children as well as with healthy children. The 23-item pediatric self-report scales include items covering a wide range of quality of life domains including physical, social, emotional and school functioning. For the purpose of this study, overall quality of life was evaluated using the total score. Internal consistency reliability is high (ranging from (α = 0.82–0.89) in a pediatric headache population.

Health-Related Quality of Life Measurement (HRQOL Parent Proxy Report-Generic Core Scales)—The Parent Proxy Report Versions of the Pediatric Quality of Life Inventory, Version 4.0 (PedsQL™ 4.0) was used to provide the parent's perception of the impact of their child's health-related quality of life (21). The items on the measures are similar to the child/teen-report versions but are worded to reflect the parent's perception of the impact of illness on the child. Internal consistency reliability for the PedsQL™ 4.0 Generic Core scales is strong (α = 0.89–0.93) (22).

Statistical analyses

Data entry was done using an SPSS Statistics Base 17 statistical package. Descriptive data on demographics and headache characteristics were computed for the sample. The prevalence of anxiety, mood and behavior disorders in the sample was then determined based on the percentage of participants who met DSM IV criteria for current as well as lifetime psychiatric diagnoses. Chi square analyses were conducted to assess whether there were any differences in younger (10- to 13-year-old) versus older (14- to 18-year-old) participants in terms of present or lifetime psychiatric diagnosis. Independent sample t tests were used to compare headache characteristics (frequency and severity) in children and adolescents with any psychiatric diagnosis, present or lifetime. A one-way multivariate analysis of variance (MANOVA) was conducted to compare headache-related disability and quality of life among those with and those without a current or life-time history of psychiatric comorbidity.

NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript

Results

Demographic information

Out of 437 eligible patients approached, 169 agreed to participate in the study (38.67%). The final sample consisted of 169 children and adolescents with a mean age of 14.4 years, SD = 2.0. The majority of the sample $N = 131$ (78%) were girls. Eighty-five percent of the sample was Caucasian. The caregiver who completed the evaluation along with the child was most often the mother (85%). Eleven percent of caregivers completing the evaluation with the adolescent were fathers. Most parents reported a household income at $50,000 or above (59%). More than 40% of fathers had an education level of college or graduate degree. Fifty percent of mothers had an education level of college or graduate degree. See Table 1 for detailed demographic information.

Headache characteristics—The average headache frequency of the sample at screening was 21.1 headaches per month (SD = 5.5). Adolescents in the sample reported their average headache severity as 5.6 on a 10-point scale (SD = 1.6). Average headache duration was 10.6 hours (SD = 8.0). There were no age-related differences in headache characteristics.

Current comorbid psychiatric disorders—Results showed that 29.6% of the sample met criteria for a current psychiatric diagnosis. Of those who met criteria for a psychiatric condition, anxiety disorders were the most common (16.6% of the sample). Mood disorders, on the other hand, were less prevalent (9.5%). The most common anxiety diagnoses were specific phobia (14 of 169), generalized anxiety disorder (10 of 169) and obsessive compulsive disorder (eight of 169). Of the 16 participants with a depressive disorder diagnosis, eight had major depressive disorder, four had a diagnosis of dysthymia, and four met criteria for other mood disorders. Behavior disorders such as attention deficit disorder were diagnosed for 11.2% of the sample (19 of 169). See Table 2 for a more detailed description of diagnoses. There was no significant difference in prevalence of current psychiatric diagnoses between younger and older adolescents, X^2 (1) = .23, $p > .05$.

Lifetime comorbid psychiatric disorders—Thirty-five percent of the sample met criteria for at least one lifetime DSM-IV diagnosis. The most common lifetime diagnoses were anxiety disorders, with 21 participants (12.4%) meeting criteria for at least one anxiety disorder. The most common lifetime anxiety diagnoses were specific phobia (seven of 169), separation anxiety (seven of 169) and generalized anxiety disorder (three of 169). Lifetime mood disorders were present in 21 participants (12.4%). Behavioral disorders were present in 29 participants (17.2%), with attention deficit hyperactivity disorder (ADHD) being the most common diagnosis. There was no significant difference in prevalence of lifetime psychiatric diagnoses between younger (age 10–13 years) and older (14–17 years) adolescents, X^2 (1) = 0.079, $p > .05$.

Headache symptoms and psychiatric disorders—*T*-tests comparing participants with ($n = 80$) and without ($n = 89$) any (present or lifetime) psychiatric diagnosis were completed. There was no significant difference in headache frequency between participants with and without a psychiatric diagnosis ($t(164) = 0.63$, $p > 0.05$). Similarly, there were no significant differences in headache duration between participants with and without a psychiatric diagnosis ($t(160) = 0.65$, $p > 0.05$) or headache severity between participants with and without a psychiatric diagnosis ($t(158) = 1.15$, $p > 0.05$).

Overall functioning and comorbid psychiatric disorders—A one-way between-groups MANOVA was performed to investigate differences in functioning (headache-related disability and quality of life) between participants with a present or lifetime

NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript

psychiatric diagnosis and those without a present or lifetime psychiatric diagnosis. Three dependent variables were used: PedMIDAS total score, PedsQL child/teen report and PedsQL parent proxy report. The independent variable was present or lifetime psychiatric diagnosis. There was a significant difference between participants with a psychiatric diagnosis and those without a psychiatric diagnosis on the combined dependent variables, $F(3, 165) = 7.17$, $p < 0.001$; Wilks' Lambda = 0.89. When the results for the dependent variables were considered separately, statistically significant differences were found on all three measures (see MANOVA results in Table 3), with participants having a lifetime psychiatric diagnosis reporting significantly worse headache-related disability and lower quality of life (child/teen report and parent proxy report).

Discussion

Contrary to the study hypothesis and findings in the adult headache literature, the findings in this clinical population of children and adolescents with CDH demonstrate that most did not meet criteria for a current comorbid psychiatric disorder, with more than 70% not meeting diagnostic criteria for a current psychiatric diagnosis. This prevalence is similar to the prevalence rate of 36% of mood and behavioral disorders that has been published in a normative community-based study of children and adolescents (23). Lifetime prevalence rates of psychiatric disorders also were not significantly elevated, with approximately 65% of the sample not meeting criteria for any lifetime psychiatric disorder. There were no differences in headache characteristics between participants with and without a psychiatric diagnosis. Overall, when diagnosis of psychiatric conditions is based on a standardized diagnostic interview, results seem to suggest that youth with CDH are not at elevated risk for psychiatric comorbidity.

On further examination, there was a slight elevation in the rate of current anxiety diagnoses in this sample of youth with CDH. The percentage of the sample meeting criteria for an anxiety disorder was slightly higher in the sample than in some published reports for children and adolescents without a chronic medical condition (24). Sixteen percent of the sample had a current diagnosis of anxiety compared to one-year prevalence rates ranging from 2% to 24% with a median of 8% for children in the general population (24). Children and adolescents with CDH may be at increased risk for anxiety problems in childhood. In addition, anxiety and depression are the psychiatric disorders most often linked with chronic headache in the adult headache population (25). This may suggest a link between psychiatric comorbidity in childhood and adulthood for those with CDH. Thus, early identification of children and adolescents with CDH and comorbid anxiety and targeted interventions for this group may also decrease anxiety and headache symptoms, and impact functioning in adulthood.

In comparing results of the current study with other pediatric pain conditions, children with CDH seemed to have fewer psychiatric comorbidities than youth with juvenile fibromyalgia or recurrent abdominal pain. Kashikar-Zuck and colleagues found high rates of psychiatric comorbidity in adolescents with fibromyalgia (26). Sixty percent of the sample of adolescents with fibromyalgia had at least one psychiatric diagnosis compared to 28% of the current sample of children and adolescents with CDH. Similarly, Campo et al. (27) reported that more than 70% of children with recurrent abdominal pain had comorbid anxiety disorders.

Among those children with CDH and a lifetime psychiatric diagnosis, the results of the current study support past findings (6,28) that difficulties with emotional functioning are associated with poor coping, greater pain-related disability and lowered quality of life. The study's findings imply that the subset of children and adolescents with CDH who present

NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript

with psychiatric comorbidity may be at an increased risk for disability and negative impact on overall quality of life. One longterm consequence of psychiatric comorbidity and functional disability may be that those with CDH and an anxiety disorder are more cautious and reluctant to engage in regular daily activities. Therefore, more intensive behavioral treatment for this subgroup of the CDH population may be needed to address emotional functioning and improve functioning.

One limitation of the study is possible limits on the generalization of findings due to sampling. The study represents findings from children and adolescents who present to a tertiary-care center for treatment of CHD and may not be representative of those who do not seek treatment or are seen in primary care. Also, participants in the study may represent a higher functioning subset of the pediatric headache population, as a pre-existing psychiatric comorbidity may have contributed to decisions by families to decline to participate in the study. Another limitation of the study is the restricted age range of the sample (which did not include children under the age of 10) and may have limited the examination of age effects on psychiatric comorbidity. In addition, the current study did not longitudinally evaluate psychiatric comorbidity. Evaluating psychiatric comorbidity in this population longitudinally may provide useful information about the way psychological functioning evolves over time and provide a link to better understanding of the pattern of development of psychiatric disorders in the adult headache population.

Future research should include multi-site studies and longitudinal designs to advance research in this area. In addition, guidelines for more tailored interventions for adolescents with CDH who present with or without psychiatric symptoms should be developed and evaluated in clinical trials.

Acknowledgments

Funding

This work was supported by NIH: National Institutes of Health RO1 NS050536.

References

1. Berg Kelly K, Ehrvér M, Erneholm T, et al. Self-reported health status and use of medical care by 3,500 adolescents in western Sweden. I. Acta Paediatr Scand. 1991; 80:837–843. [PubMed: 1957604]
2. Hershey AD, Kabbouche MA, Powers SW. Chronic daily headaches in children. Curr Pain Headache Rep. 2006; 10:370–376. [PubMed: 16945254]
3. Kernick D, Campbell J. Measuring the impact of headache in children: A critical review of the literature. Cephalalgia. 2009; 29:3–16. [PubMed: 18798844]
4. Hershey AD, Powers SW, Vockell AL, et al. PedMIDAS: Development of a questionnaire to assess disability of migraines in children. Neurology. 2001; 57:2034–2039. [PubMed: 11739822]
5. Hershey AD, Powers SW, Bentti AL, et al. Characterization of chronic daily headaches in children in a multidisciplinary headache center. Neurology. 2001; 56:1032–1037. [PubMed: 11320174]
6. Lewandowski AS, Palermo TM, Peterson CC. Age-dependent relationships among pain, depressive symptoms, and functional disability in youth with recurrent headaches. Headache. 2006; 46:656–662. [PubMed: 16643561]
7. Frediani F, Villani V. Migraine and depression. Neurol Sci. 2007; 28(Suppl. 2):S161–S165. [PubMed: 17508165]
8. Radat F, Swendsen J. Psychiatric comorbidity in migraine: A review. Cephalalgia. 2005; 25:165–178. [PubMed: 15689191]
9. Maizels M, Smitherman TA, Penzien DB. A review of screening tools for psychiatric comorbidity in headache patients. Headache. 2006; 46(Suppl. 3):S98–S109. [PubMed: 17034404]

NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript

10. Baskin SM, Lipchik GL, Smitherman TA. Mood and anxiety disorders in chronic headache. Headache. 2006; 46(Suppl. 3):S76–S87. [PubMed: 17034402]
11. Pompili M, Di Cosimo D, Innamorati M, et al. Psychiatric comorbidity in patients with chronic daily headache and migraine: A selective overview including personality traits and suicide risk. J Headache Pain. 2009; 10:283–290. [PubMed: 19554418]
12. Baskin SM, Smitherman TA. Migraine and psychiatric disorders: Comorbidities, mechanisms, and clinical applications. Neurol Sci. 2009; 30(Suppl 1):S61–S65. [PubMed: 19415428]
13. Heckman BD, Holroyd KA, Himawan L, et al. Do psychiatric comorbidities influence headache treatment outcomes? Results of a naturalistic longitudinal treatment study. Pain. 2009; 146:56–64. [PubMed: 19660866]
14. Pakalnis A, Butz C, Splaingard D, et al. Emotional problems and prevalence of medication overuse in pediatric chronic daily headache. J Child Neurol. 2007; 22:1356–1359. [PubMed: 18174551]
15. Puca F, Genco S, Prudenzano MP, et al. Psychiatric comorbidity and psychosocial stress in patients with tension-type headache from headache centers in Italy. The Italian Collaborative Group for the Study of Psychopathological Factors in Primary Headaches. Cephalalgia. 1999; 19:159–164. [PubMed: 10234463]
16. Kaufman J, Birmaher B, Brent D, et al. Schedule for Affective Disorders and Schizophrenia for School-Age Children-Present and Lifetime Version (K-SADS-PL): Initial reliability and validity data. J Am Acad Child Adolesc Psychiatry. 1997; 36:980–988. [PubMed: 9204677]
17. Wang SJ, Juang KD, Fuh JL, et al. Psychiatric comorbidity and suicide risk in adolescents with chronic daily headache. Neurology. 2007; 68:1468–1473. [PubMed: 17470748]
18. Amouroux R, Rousseau-Salvador C. Anxiety and depression in children and adolescents with migraine: A review of the literature (in French). Encephale. 2008; 34:504–510. [PubMed: 19068340]
19. Hamelsky SW, Lipton RB. Psychiatric comorbidity of migraine. Headache. 2006; 46:1327–1333. [PubMed: 17040330]
20. Cohen LL, Lemanek K, Blount RL, et al. Evidence-based assessment of pediatric pain. J Pediatr Psychol. 2008; 33:939–955. discussion 956-937. [PubMed: 18024983]
21. Varni JW, Seid M, Rode CA. The PedsQL: Measurement model for the pediatric quality of life inventory. Med Care. 1999; 37:126–139. [PubMed: 10024117]
22. Varni JW, Seid M, Kurtin PS. PedsQL 4.0: Reliability and validity of the Pediatric Quality of Life Inventory version 4.0 generic core scales in healthy and patient populations. Med Care. 2001; 39:800–812. [PubMed: 11468499]
23. Costello EJ, Mustillo S, Erkanli A, et al. Prevalence and development of psychiatric disorders in childhood and adolescence. Arch Gen Psychiatry. 2003; 60:837–844. [PubMed: 12912767]
24. Merikangas KR, Nakamura EF, Kessler RC. Epidemiology of mental disorders in children and adolescents. Dialogues Clin Neurosci. 2009; 11:7–20. [PubMed: 19432384]
25. Merikangas KR, Angst J, Isler H. Migraine and psychopathology. Results of the Zurich cohort study of young adults. Arch Gen Psychiatry. 1990; 47:849–853.
26. Kashikar-Zuck S, Parkins IS, Graham TB, et al. Anxiety, mood, and behavioral disorders among pediatric patients with juvenile fibromyalgia syndrome. Clin J Pain. 2008; 24:620–626. [PubMed: 18716501]
27. Campo JV, Bridge J, Ehmann M, et al. Recurrent abdominal pain, anxiety, and depression in primary care. Pediatrics. 2004; 113:817–824. [PubMed: 15060233]
28. Kashikar-Zuck S, Goldschneider KR, Powers SW, et al. Depression and functional disability in chronic pediatric pain. Clin J Pain. 2001; 17:341–349. [PubMed: 11783815]

NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript

Table 1

Demographic characteristics of children and adolescents with a current psychiatric diagnosis (*N*=50) and with no current psychiatric diagnosis (*N*=119).

Characteristics	Mean	SD
Participant's age	14.38	2.02
	Number	%
Participant's gender		
Male	37	21.9
Female	132	78.1
Participant ethnicity		
Caucasian	144	85.2
African American	17	10.1
Hispanic	6	3.6
American Indian/Alaskan Native	1	0.6
Asian	1	0.6
Mother's educational level		
Less than high school	3	1.8
High school diploma	37	21.9
Some college or technical school	46	27.2
College degree	58	34.3
Graduate school degree	25	14.8
Father's educational level		
Less than high school	10	5.9
High school diploma	41	24.3
Some college or technical school	42	24.9
College degree	49	29.0
Graduate school degree	19	11.2
Unknown/missing	8	4.7
Family income		
$0–$9,999	14	8.3
$10,000–$19,999	6	3.6
$20,000–$29,999	16	9.5
$30,000–$39,999	11	6.5
$40,000–$49,999	21	12.4
$50,000–$59,999	99	58.6

NIH-PA Author Manuscript
NIH-PA Author Manuscript
NIH-PA Author Manuscript

Table 2

Prevalence of psychiatric disorders in adolescents with CDH (*N*=169).

	Current	Lifetime
Disorder	***N* (%)**	***N* (%)**
Any psychiatric diagnosis	50 (29.6)	60 (35.5)
Any anxiety disorder	28 (16.6)	21 (12.4)
Obsessive compulsive disorder	8 (4.7)	4 (2.4)
Specific phobia	14 (8.3)	7 (4.1)
Generalized anxiety disorder	10 (5.9)	3 (1.8)
Separation anxiety	2 (1.2)	7 (4.1)
Other	7 (4.1)	9 (5.3)
Any mood disorder	16 (9.5)	21 (12.4)
Major depressive disorder	8 (4.7)	13 (7.7)
Dysthymic disorder	4 (2.4)	1 (0.6)
Other mood disorders	6 (3.6)	8 (4.7)
Any behavioral disorder	19 (11.2)	29 (17.2)
Attention-deficit disorder	15 (8.9)	15 (8.9)
Other behavioral disorder	6 (3.5)	17 (10.1)
Participants with >1 diagnosis	23 (13.6)	17 (10.1)

CDH: chronic daily headache.

NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript

Table 3

MANOVA analysis of differences between adolescents with and without a lifetime psychiatric comorbidity.

	Psychiatric comorbidity (*n*=42) Mean (SD)	No psychiatric comorbidity (*n*=51) Mean (SD)	F	*P*
PedMIDAS Total Score	71.12 (35.05)	53.94 (27.23)	7.07	.009 *
PedsQL Child/Teen Report	68.11 (16.13)	75.83 (12.36)	6.82	.010 *
PedsQL Parent Report	69.95 (14.90)	77.02 (15.93)	4.80	.031 *

MANOVA: multivariate analysis of variance; PedMIDAS: Pediatric Migraine Disability Assessment; PedsQL: The Pediatric Quality of Life Inventory.

* Statistically significant at.05.