

Exploring the Influence of Age and Gender on Functional Disability, Pain Catastrophizing, and Internalizing Symptoms Amongst Youth with Migraine

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Abstract:

Migraine is the most common cause of headache in youth and associated with disability, internalizing symptoms, catastrophizing, and lower quality of life. Before puberty, boys experience migraine more frequently than girls, but after puberty migraine affects girls more often. The present study explored relationships between functional disability, anxiety, pain catastrophizing, and depression with age and gender. We hypothesized that older age and female gender would be associated with increased functional disability, pain catastrophizing, and internalizing symptoms. Demographic data, headache characteristics, and mental health history were gathered through retrospective chart review of 243 youth (78.6% Female, 86% Caucasian; mean age: 14.23 years). Measures included the Functional Disability inventory (FDI), Pain Catastrophizing Scale (PCS), Beck Depression Inventory for Youth (BDI-Y), and Beck Anxiety Inventory for Youth (BAI-Y). For both the BDI-Y and BAI-Y, age was significantly correlated with the BDI-Y and BAI-Y for females (BDI-Y: $r=.255, p<.001$; BAI-Y: $r=.343, p<.001$) but not males (BDI-Y: $p=.266$; BAI-Y: $p=.314$). When examining males and females separately, age and FDI total score was only significant for females ($p=.002$). Caregiver FDI revealed that age and caregiver FDI total score was only significantly related in females ($r=.165, p=.024$). Males and females were significantly different on the BAI-Y [$F(1, 241)=4.949, p=.027, \eta^2=.020$], with females scoring higher than males (50.94 vs 47.2, respectively). Total PCS score was positively correlated in females ($r=.167, p=.022$) and negatively correlated in males ($r=-.381, p=.006$). When assessing migraine patients, it is important to consider age and gender differences, with special consideration for internalizing symptoms and functional disability in adolescent females and pain catastrophizing in younger males. Given that PCS scores were negatively correlated in males, future research should further explore differences in ages and gender on the PCS in migraine patients.

Introduction:

- Migraine is the most common cause of primary headache in children and adolescents. Commonly associated with:
 - Pain-related disability, internalizing symptoms, pain catastrophizing, lower quality of life, and fewer pain coping strategies.
- Before puberty, migraine is more common in boys. During adolescence, it is more common in girls.
- Age and gender had only been examined in relation to internalizing symptoms. The relationship between age and gender to other variables, such as pain catastrophizing and disability, had not yet been explored.
- The present study sought to explore relationships between commonly co-occurring variables (e.g., functional disability, anxiety, pain catastrophizing, and depression) with age and gender.

Method:

- **Sample:** 243 youth (78.6% Female, 86% Caucasian). The mean age was 14.23 years. 28% of the patients had a primary diagnosis of migraine without aura and 19.1% migraine with aura. See Tables below for additional characteristics of the sample.
- **Measures:** Demographic data, headache characteristics, mental health history, functional disability (FDI), pain catastrophizing (PCS), and internalizing symptoms (Beck Youth Inventories).
- **Procedures:** Retrospective chart review.

Table 1. Demographic Characteristics of the Sample

	n	%		n	%	
Pain Severity			Mental Health Disorders			
	Mild	13	5.4	Yes	101	41.6
	Moderate	121	50	No	142	58.4
Severe	108	44.6				
Pain Frequency			Mental Health Counseling			
	Episodic	168	69.4	Yes	137	56.4
	Chronic	33	13.6	No	106	43.6
Daily	41	16.9				
Headache Duration			Mental Health Medications			
	Short	50	20.7	Yes	67	27.7
	Long	192	79.3	No	175	72.3

Results:

Age Findings: Correlations between parent and child measures with child age

Table 2. Correlations between Parent and Child Functional Disability, Pain Catastrophizing, Internalizing Symptoms, and Age

	CHILD-FDI Total	CHILD PCS-TOTAL PERCENTILE	CHILD- BDI T- SCORE	CHILD- BAI T- SCORE	PARENT- FDI Total	AGE	PARENT PCS-TOTAL PERCENTILE
CHILD-FDI Total	1	.515**	.416**	.385**	.573**	0.138	.261**
CHILD PCS-TOTAL PERCENTILE	.515**	1	.453**	0.517	.281**	0.055	.372**
CHILD- BDI T- SCORE	.416**	.453**	1	.775**	.337**	.247**	.209**
CHILD- BAI T- SCORE	.385**	.517**	.775**	1	.311**	.327**	.150**
PARENT- FDI Total	.573**	.281**	.337**	>.311**	1	0.117	.291**
AGE	.138*	0.055	.247**	.327**	0.117	1	0.071
PARENT PCS-TOTAL PERCENTILE	.261**	.372**	.209**	.150*	.291**	0.071	1

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Additional Gender Findings:

- For both the BDI and BAI, within gender analyses revealed that age was significantly correlated with the BDI and BAI for females (BDI: $r=.255, p<.001$; BAI: $r=.343, p<.001$) but not males (BDI: $p=.266$; BAI: $p=.314$).
- Males and females did not score differently on the FDI [$F(1, 242)=.278, p=.598, \eta^2=.001$]. However, when examining males and females separately, age and FDI total score was only significant for females ($p=.002$).
- Caregiver report on the FDI revealed similar findings in that age and caregiver FDI total score was only significantly related in females ($r=.165, p=.024$).
- Males and females were significantly different on the BAI [$F(1, 241)=4.949, p=.027, \eta^2=.020$], with females scoring higher than males (50.94 vs 47.2, respectively).
- Total PCS score was positively correlated in females ($r=.167, p=.022$) and negatively correlated in males ($r=-.381, p=.006$).

Conclusions:

- Given our finding that PCS scores were negatively correlated in males, future research would benefit from further exploring differences in ages and gender on the PCS in pediatric migraine patients.
- Younger males tend to have increased prevalence of migraine, which may have accounted for some of the differences in scores on the PCS.
- When assessing pediatric migraine patients, it is important to consider age and gender differences in anxiety, depression, functional disability, and pain catastrophizing
 - Special consideration for internalizing symptoms and functional disability in adolescent females and pain catastrophizing in younger males.

References:

- Claar, R. L., & Walker, L. S. (2006). Functional assessment of pediatric pain patients: psychometric properties of the functional disability inventory. *Pain*, 121(1-2), 77-84.
- Flink, I. L., Boersma, K., & Linton, S. J. (2013). Pain catastrophizing as repetitive negative thinking: a development of the conceptualization. *Cognitive behaviour therapy*, 42(3), 215-223.
- Guite, J. W., Logan, D. E., Sherry, D. D., & Rose, J. B. (2007). Adolescent self-perception: associations with chronic musculoskeletal pain and functional disability. *The Journal of Pain*, 8(5), 379-386.
- Hershey, A. D., Powers, S. W., Vockell, A. L., LeCates, S., Kabbouche, M. A., & Maynard, M. K. (2001). PedMIDAS: development of a questionnaire to assess disability of migraines in children. *Neurology*, 57(11), 2034-2039.
- Heyer, G. L., Merison, K., Rose, S. C., Perkins, S. Q., Lee, J. M., & Stewart, W. C. (2014). PedMIDAS-Based scoring underestimates migraine disability on non-school days. *Headache: The Journal of Head and Face Pain*, 54(6), 1048-1053.
- Kashikar-Zuck, S., Vaught, M. H., Goldschneider, K. R., Graham, T. B., & Miller, J. C. (2002). Depression, coping, and functional disability in juvenile primary fibromyalgia syndrome. *The Journal of Pain*, 3(5), 412-419.
- Lewandowski, A. S., Palermo, T. M., & Peterson, C. C. (2006). Age-dependent relationships among pain, depressive symptoms, and functional disability in youth with recurrent headaches. *Headache: The Journal of Head and Face Pain*, 46(4), 656-662.
- Lewis, D. W. (2010). Pediatric migraine. In *Clinician's Manual on Treatment of Pediatric Migraine* (pp. 15-26). Springer Healthcare, Tarporley.
- Logan, D. E., & Scharff, L. (2005). Relationships between family and parent characteristics and functional abilities in children with recurrent pain syndromes: an investigation of moderating effects on the pathway from pain to disability. *Journal of Pediatric Psychology*, 30(8), 698-707.
- Lynch, A. M., Kashikar-Zuck, S., Goldschneider, K. R., & Jones, B. A. (2006). Psychosocial risks for disability in children with chronic back pain. *The Journal of Pain*, 7(4), 244-251.
- McKillop, H. N., & Banez, G. A. (2016). A broad consideration of risk factors in pediatric chronic pain: Where to go from here?. *Children*, 3(4), 38.
- Orr, S. L., Christie, S. N., Akiki, S., & McMillan, H. J. (2017). Disability, quality of life, and pain coping in pediatric migraine: An observational study. *Journal of Child Neurology*, 32(8), 717-724.
- Powers, S. W., Patton, S. R., Hommel, K. A., & Hershey, A. D. (2003). Quality of life in childhood migraines: Clinical impact and comparison to other chronic illnesses. *Pediatrics*, 112(1), e1-e5.
- Scirucchio, V., Simeone, M., Foschino Barbaro, M. G., Tanzi, R. C., Delussi, M. D., D'Agnano, D., ... & de Tommaso, M. (2019). Pain catastrophizing in childhood migraine: an observational study in a tertiary headache center. *Frontiers in Neurology*, 10, 114.
- Walker, L. S., & Greene, J. W. (1991). The functional disability inventory: measuring a neglected dimension of child health status. *Journal of Pediatric Psychology*, 16(1), 39-58.