Hope and its Relationship with Mental, Physical, and Overall Health in Youth with Chronic Musculoskeletal Pain

Background/Purpose: Hope, the perceived capability to derive pathways to desired goals and motivate oneself via agency thinking to use those pathways plays a key protective role in pediatric health contributing to improved quality of life, active coping, and positive health changes. However, prior studies suggest that youth with chronic illnesses report lower hope and youth with chronic musculoskeletal pain report (CMP) lower health related quality of life. Yet, the relationship between hope and patient reported health outcomes (PROs) in youth with CMP remains unknown. We sought to quantify hope levels in adolescents with CMP and examine demographics, clinical characteristics, and patient reported outcomes associated with hope.

Methods: We conducted a secondary analysis of baseline data from a prospective longitudinal survey design study of youth with CMP presenting to a pediatric subspeciality pain clinic for initial evaluation. Eligibility criteria included: ages 12-17 years, diagnosis of CMP defined as defined as bone, joint, muscle, or related soft tissue pain lasting ≥ 3 months by the treating physician, English as primary or second language, presenting to Amplified Musculoskeletal Pain Syndrome clinic for initial consultation. Eligible patients completed multiple surveys of greatest importance to this analysis including: 1) hope scores 2) PROs mental health scores 3) PROs physical health scores, 4) PROs overall health scores. We performed Spearman's rank correlation coefficients to evaluate associations between patient hope and outcome measures listed above.

Results: 60 patients completed their assessments and were included in this cross-sectional analysis. Baseline characteristics of the adolescent CMP cohort are summarized in Table 1. In terms of mental health measures, we observed a moderate negative correlation between hope scores and depression ($r=-0.61$, $p<0.01$), anxiety ($r=-0.49$, $p<0.01$), and psychological distress ($r=-0.52$, $p<0.01$), and strong positive correlation between hope scores and resilience ($r=0.74$, $p<0.01$). Furthermore, hope scores did not correlate with pain intensity or pain interference however had a moderate negative correlation with the level of disability patients experienced ($r=-0.43$, $p<0.01$). Lastly a moderate positive correlation was found between patient reported hope scores and overall health ($r=0.55$, $p<0.01$) (Table 2).

Conclusion: Youth with CMP have on average lower levels of hope than that of similar age youth in the general population. Additionally, hope has significant correlation with mental health measures, functional disability, and overall health in youth with CMP. Of note the agency sub-score demonstrates a stronger correlation in many of the PROs. This finding supports previous literature demonstrating the importance of internal locus of control in chronic illness. Further investigation remains necessary to better elucidate which interventions are most likely to bolster hope in youth with CMP to improve their mental health, functional disability, and overall health.

Table 1: Baseline Characteristics of Study Cohort

	Adolescents with CMP (n=60)
Age, median (IQR) years	15 (14 - 16)
Female (%)	51 (85.0)
Non-Hispanic, n (%)	53 (88.3)
White, n (%)	47 (78.3)
Children's Hope Scale Scores[1]	
No to very low hope, n (%)	6 (10.0)
Slightly hopeful, n (%)	32 (53.3)
Moderately hopeful, n (%)	18 (30.0)
Highly hopeful, n (%)	4 (6.7)
Mental Health Scores[2]	
PHQ-8, median (IQR)	11.5 (6.8-18.3)
GAD-7, median (IQR)	8.5 (4.75-14)
K-6, median (IQR)	10 (6-13.5)
CD-RISC10, median (IQR)	24 (17.75-29.25)
Physical Health Scores[3]	
FDI, median (IQR)	29.5 (12.75-36)
Pain Intensity, median (IQR)	6.5 (4-8)
PROMIS Pain Interference, median (IQR)	63.4 (55.0-67.2)
Overall Health Scores[4]	
PROMIS PGH7, median (IQR)	32.9 (27.2-37.7)

[1]Children's Hope Scale Scores: Scores of 6-12 low hope, 13-23 indicate slightly hopeful, 24-29 indicate moderately hopeful, and 30-36 indicates highly hopeful.

[2]Mental Health Scores: PHQ8—Personal Health Questionnaire Depression Scale score range 0-24 with scores >4 indicating depression. GAD7—Generalized Anxiety Disorder 7 score range 0-21 with scores >4 indicating anxiety. K6—Kessler Psychological Distress Scale 6-Item score 0-24 with scores >12 likely to be experiencing severe mental illness. CD-RISC10—Connor Davidson Resilience Scale 10-Item score 0-40 with score <20 demonstrating low resilience

[3]Physical Health Scores: FDI—Functional Disability Inventory score range score 0-60 higher score indicating greater disability. Pain Intensity—Pain intensity over past 7 days score range 0-10 higher score indicating greater pain intensity. PROMIS Pain Interference—Patient-Reported Outcome Measurement System Pain Interference score t-score normed at 50, SD of 10

[4]Overall Health Scores: PROMIS PGH7—Patient-Reported Outcome Measurement System Pediatric Global Health 7 Item t-score normed at 50, SD of 10

Table 2: Correlation between Hope and Patient Reported Health Outcomes

	Patient Children's Hope Scale		
	Pathway Subscore	Agency Subscore	Total Score
Mental Health Scores	r (p)	r (p)	r (p)
PHQ-8, median (IQR)	-0.51 (p<0.01)	-0.59 (p<0.01)	-0.61 (p<0.01)
GAD-7, median (IQR)	-0.37 (p<0.01)	-0.51 (p<0.01)	-0.49 (p<0.01)
K-6, median (IQR)	-0.42 (p<0.01)	-0.52 (p<0.01)	-0.52 (p<0.01)
CD-RISC, median (IQR)	0.72 (p<0.01)	0.66 (p<0.01)	0.74 (p<0.01)
Physical Health Scores			
FDI	-0.28 (p<0.05)	-0.48 (p<0.01)	-0.43 (p<0.01)
Pain Intensity	-0.05 (p=0.72)	-0.23 (p=0.08)	-0.16 (p=0.20)
PROMIS Pain Interference	-0.13 (p=0.34)	0.04 (p=0.75)	-0.04 (p=0.77)
Overall Health Scores			
PROMIS PGH7	0.46 (p<0.01)	0.57 (p<0.01)	0.55 (p<0.01)