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## Treatment expectations among adolescents with chronic musculoskeletal pain and their parents before an initial pain clinic evaluation

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### Abstract

**Objectives**—To understand expectations regarding treatment recommendations among treatment-seeking adolescents with chronic musculoskeletal pain and their parents.

**Methods**—A total of 102 adolescent-parent dyads were recruited at the time of initial contact with a multidisciplinary pain management clinic. Each participant completed reports of adolescent pain intensity and disability, biopsychosocial perspective of pain, and treatment expectations related to recommendations and feedback for a vignette description of an adolescent presenting at an initial multidisciplinary pain clinic evaluation.

**Results**—Descriptive findings for individual treatment expectations and adolescent-parent dyad agreement statistics were examined. Slight to fair levels of agreement occurred for 50% of the expectations assessed. The strongest shared expectations were for recommendations to return to school, pursue psychological counseling, and pursue PT/OT treatment. Stronger agreement occurred for items reflecting alternative, emotional, behavioral, and activity recommendations with weaker agreement for medical interventions (eg, medication and surgery). Correlations emerged between individual expectations and adolescent pain intensity, disability, with the greatest number of significant relationships found for adolescent and parent expectations and biopsychosocial perspectives of pain.

**Discussion**—Our results document that adolescents and parents show modest levels of agreement on expectations for treatment at the time of an initial pain clinic evaluation. This may relate to expectations being internal perspectives not clearly expressed within families; thus, the initial treatment consultation may provide an important opportunity to create and align appropriate expectations. Implications of our findings are considered with respect to education, treatment, and future research to understand factors that contribute to treatment adherence and outcomes.

## Keywords

chronic pain; treatment; expectations; biopsychosocial

## Introduction

Chronic pediatric pain is a complex problem that generally requires a multidisciplinary approach for effective management<sup>1–4</sup>. Recent research suggests that there is significant variability in patient and family adherence to multidisciplinary interventions for chronic pediatric pain<sup>5</sup>. A greater understanding of factors that influence engagement in and adherence to pain interventions among pediatric patients and their parents is needed. Conceptual and methodological challenges to addressing these issues include the participation of parents in the assessment and treatment process, the complexity of treatment plans, and the active role both parents and children play in determining how treatment is managed<sup>6</sup>. Patterns of agreement and disagreement have been found between the reports of pain-related functioning made by adolescents with chronic pain and their parents<sup>7</sup>. Thus, it may be important to consider unique patient and parent perspectives regarding the pain problem to ensure appropriate assessment (e.g., so that a selective focus on only one source of data does not under-represent symptoms) and subsequent motivation to engage in treatment recommendations. Given that: 1) accurate assessment of pediatric chronic pain is essential to guiding treatment decisions, and 2) both patients and parents play an active role in the evaluation and treatment process, it is critical for both clinicians and researchers to be aware of potential patterns of agreement and disagreement in patient-parent perspectives at the outset of treatment.

Treatment expectations may play an important role in understanding patient and parent willingness to engage in and adhere to effective treatments for pediatric chronic pain. Positive expectations for treatment and recovery have been associated with better health outcomes in adults with a range of health problems<sup>8</sup>. Research within outpatient child mental health settings suggests that parents with less accurate expectations about child psychotherapy are more likely to end their child's treatment prematurely<sup>9</sup>. However, far less is known about treatment expectations in pediatric pain populations<sup>10</sup>. Within the scant available literature, Tsao and colleagues (2005)<sup>11, 12</sup> examined patient and parent expectations regarding various complementary and alternative medicine (CAM; e.g., hypnosis, acupuncture) and conventional treatments (e.g., medications, surgery) and found parents' expectations for CAM were more positive than children's expectations. More recently, Simons and colleagues (2010)<sup>5</sup> reported a relationship between favorable parent-reported treatment expectations and treatment adherence within a pediatric chronic pain clinic population. In addition, Claar and Simons (2011)<sup>13</sup> report that pediatric pain patients categorized as "adaptive" (vs. "non-adaptive") copers and their parents are more likely to expect psychological treatments to be helpful, but did not find any between-group difference in patients' later participation in psychological treatment.

The Biopsychosocial Model of Illness<sup>14, 15</sup> asserts the importance of psychological, social, behavioral, and biomedical factors in understanding health and illness and has become a widely accepted framework for understanding chronic pain and its treatment<sup>15</sup>. Consistent with this model, chronic pediatric pain management typically includes developmentally appropriate assessment with patient/parent(s), education, focusing treatment on maximizing function (e.g., school attendance), encouraging aerobic exercise, emphasizing sleep hygiene, utilizing pharmacologic and non-pharmacologic pain management strategies, and treating comorbid symptoms of anxiety and depression<sup>16</sup>. Acceptance of a "biopsychosocial perspective" by patients and parents may be important for the resolution of chronic pain.

Claar and colleagues<sup>17</sup> identified that many mothers acknowledge the contribution of both psychosocial and physical factors as important in the etiology of their children's abdominal pain and suggest that families may be receptive to psychological/behavioral interventions if providers present them as an integral component of treatment. In addition, Crushell and colleagues<sup>18</sup> report that children of parents who acknowledged a "psychological" (vs. a purely "physical") cause for their child's abdominal pain were significantly more likely to later recover. Thus, endorsement of a biopsychosocial perspective of pain may influence not only how patients and parents understand the child's pain, but also their expectations for treatment. For example, patients and parents who do not appreciate that psychosocial and behavioral factors can play a role in pediatric chronic pain may not expect or understand the relevance of a recommendation to pursue treatments such as psychological counseling.

Informed by Biopsychosocial models<sup>14, 15</sup> and the broader literature focusing on parent and family factors related to pediatric chronic pain and disability<sup>19</sup>, the primary aim of this study is to explore and describe adolescent and parent treatment expectations at an initial pediatric pain clinic consultation. Agreement between adolescent-parent dyad reports for individual treatment expectations will be examined and we hypothesize that there will be significant adolescent-parent agreement on the individual expectations items. Relationships between individual expectations and pain intensity, functional disability, and biopsychosocial perspective of pain will be further explored to provide a foundation from which to generate future hypotheses. Based on the limited available research, we hypothesize that parents will more strongly endorse a biopsychosocial perspective of pain than adolescents. We further hypothesize expectations related to psychological and CAM treatments will be positively correlated with a biopsychosocial perspective of pain for both adolescents and parents.

## Materials and Methods

### Participants

A total of 107 adolescents and parents were prospectively recruited between 2007 and 2010 from a large pediatric institution that provides specialized tertiary care for the management of chronic pain. Participants were contacted prior to their initial evaluation appointment and consent/assent was provided via an Institutional Review Board (IRB) approved protocol exploring pain beliefs, treatment expectations and short term outcomes for adolescents with chronic pain. This project focuses on adolescent and parent treatment expectations in relation to initial reports of adolescent pain, disability, and a biopsychosocial perspective of pain in the context of the broader study. Patients were referred from a variety of medical subspecialties (e.g., orthopedics, rheumatology) and primary care pediatricians, usually after other treatment attempts failed to substantially reduce symptoms. The majority of participating patients had seen between 3–6 doctors while looking for pain relief. Participating parents were asked to estimate their child's use of medical services for 1 year before coming to our clinic for pain related problems and reported a Mean of 15.46 "office visits" (SD=18.3; Median = 8.5; Mode = 4).

Adolescents were eligible for participation if: 1) they were between 13–18 years of age, 2) they had a primary complaint of musculoskeletal pain (including, but not limited to, complex regional pain syndrome, fibromyalgia, or idiopathic musculoskeletal pain syndromes) lasting 3 months or longer, 3) their musculoskeletal pain was not related to chronic disease (e.g., juvenile idiopathic arthritis [JIA], lupus, abnormal biomechanics), and 4) they were not significantly cognitively impaired. After the initial pain clinic evaluation, four adolescent/parent dyads were subsequently excluded based on pain diagnosis criteria and one dyad chose to discontinue participation. Thus, a total of 102 adolescent and parent participants were included in the final sample. All participating parents were living in the same home as the adolescent.

## Procedure

A description of the research project was mailed to patients when they scheduled the initial appointment along with routine clinic paperwork. All referrals to the clinic receive an introductory letter describing the multidisciplinary program and providers as well as questionnaires to assess medical history and psychosocial functioning. Measures relevant to the current study aims collected in this packet included those used to assess demographics, adolescent pain and functional disability. The introductory letter specifically states that, “The Pain Management Team will share their impressions and discuss treatment options with you in order to develop a program to manage your pain. Your pain management program may include recommendations for psychological counseling and treatment such as cognitive-behavioral pain management techniques (biofeedback, developing coping/relaxation skills, increasing your ability to function with pain) and family-based treatment aimed at managing stresses associated with chronic pain. Treatment recommendations may also include Physical and Occupational Therapy. When indicated, medication instructions and prescriptions will be provided. Occasionally non-traditional therapies such as acupuncture, massage, or yoga will be recommended. Finally, expect to schedule follow-up appointments.” Eligible families who were interested in participating in the research project met with research staff at the clinic immediately before the initial appointment. At this time, informed consent was provided to examine information from the patient’s health record and to have adolescents and parents separately complete the treatment expectation and biopsychosocial perspective measures.

## Measures

**Pain Management Overview Questionnaire**—Parents provided information about the adolescent’s pain and medical history, parent and family pain and medical history, and family demographic information including adolescent age, sex, ethnicity, grade, pain duration, parent participant, frequency of doctors visits in the last year, number of persons living in the home and family socioeconomic status (SES)<sup>20</sup>.

**Pain Intensity**—Adolescents reported on their usual, most and least pain intensity during the preceding 2 weeks using a 100 mm visual analog scale (VAS)<sup>21</sup>. Scores were anchored at 0=“no pain” to 100=“unbearable pain”, with higher scores reflecting greater pain intensity. VAS pain intensity ratings have established reliability and validity<sup>22, 23</sup>.

**Functional Disability**—Patient self-reports and parent reports were collected using the Functional Disability Inventory (FDI)<sup>24</sup> which assesses children’s difficulty in physical and psychosocial functioning due to their physical health. The instrument consists of 15 items concerning perceptions of activity limitations during the past two weeks that are rated 0=“no trouble”, 1=“a little trouble”, 2=“some trouble”, 3=“a lot of trouble”, and 4=“impossible”. A total summary score was used in analyses (range 0–60). The FDI has demonstrated reliability and validity in adolescents ages 8–18<sup>24–26</sup>. In the current sample, alpha reliability for the FDI total score was 0.91 for adolescent and 0.93 for parent reports.

**Treatment Expectations**—Adolescent and parent expectations regarding chronic pain treatment were each assessed indirectly through responses to a series of items after reading the following vignette describing an adolescent with chronic pain.

“Mary is a teenager who has had pain in her muscles and joints for the last 6 months. During this time, she has missed several days of school. When Mary is able to go to school, she misses classes a lot and often leaves school early because of pain. Mary doesn’t participate in her regular activities or spend time with friends as much as she used to before her pain started. Over the last 6 months, Mary has

been having a hard time sleeping, has little energy, doesn't feel like eating, and has been having a hard time concentrating on things like schoolwork. She doesn't enjoy things like she used to. She has been feeling down on herself, more worried about things, and has noticed her muscles feeling more tense. Mary and her parents have visited many doctors to treat her pain, but so far Mary's pain problem has not gotten better. Mary has recently been told she should go to a pain clinic for treatment. Please read each sentence below and circle the response that best says what you think Mary may believe or expect from her visit to the pain clinic."

The same vignette was read by all participants. This methodology has the benefit of standardizing the information participants respond to and has been used in other studies focusing on perceptions of pediatric pain<sup>27, 28</sup>.

The vignette description and response items were developed for this project to indirectly assess participants' treatment expectations by asking them to speculate as to what the vignette character expects from her visit. Participants were specifically asked to report on the vignette character's expectations (including hopefulness for the pain problem getting better or cured), rather than their expectations for their own evaluation, to attempt to minimize potential social desirability reporting bias that has been previously described for pediatric pain patients<sup>29</sup>. Participants were presented with 20 treatment-specific items (see Table 3) and asked to indicate the response that, "best says what you think Mary may believe or expect from her visit to the pain clinic," using a 5-point scale (0 = Not at all, 1 = A little, 2 = Some, 3 = Mostly, 4 = Very). Cronbach's alpha for the 20 items reported by parents was 0.789 and was 0.805 for adolescent reports. These exploratory items were not created with the intent to generate a composite total score, but rather to be examined individually to provide initial findings from which to generate future hypotheses. A skewed distribution of responses occurred on multiple expectations items, such that the full range of 0–4 responses were not utilized for all items. This resulted in kappa statistics not being able to be generated for multiple items. To address this problem, expectations item responses were re-coded into the following three groups for further analysis (0 = Not at all, A little; 1 = Some; 2 = Mostly, Very) (See Table 3).

Finally, perceived similarity of the adolescent's own pain experience to the vignette character's experience was also assessed to indicate the extent to which the expectations attributed to the vignette character may reflect the participant's own treatment expectations for the clinic visit. Similarity ratings ranged from 0–10 using the anchors 0="Strongly disagree", 5 = "Not sure", and 10="Strongly agree".

**Biopsychosocial perspective of pain**—Two items were created to briefly assess the adolescent's and parent's degree of endorsement of a biopsychosocial perspective of pain. This construct was composed of each respondent's agreement with two core concepts related to the cause of pain, distilled from clinical interactions and research focusing on parental conceptions of causal factors for pediatric pain<sup>18, 30</sup>. Specifically, this construct was assessed by participants' direct ratings of, "how much you agree with," two statements: 1) ("DAMAGE" variable=) "Pain always means a part of the body is damaged," and 2) ("EMOTION" variable=) "Pain is affected by feelings and emotions." Responses ranged from 0–10 and were anchored at 0="Strongly disagree", 5 = "Not sure", and 10="Strongly agree", with the DAMAGE variable reverse scored (i.e., 10-DAMAGE value). A combined total score ("BIOPSYCH") was calculated [(10-DAMAGE + EMOTION) = score range 0–20], with higher scores reflecting stronger endorsement of a biopsychosocial perspective for pain.

## Data Analysis Plan

Descriptive statistics for study measures were generated. Agreement for categorical data (i.e., treatment-specific expectations items) was tested using Kappa coefficients. This agreement statistic evaluates how closely two measures agreed with each other in terms of the actual values in addition to how the measures are linearly correlated with each other, as captured by the usual correlation coefficient. A Kappa coefficient  $>0.7$  indicates excellent or strong agreement,  $0.4$  to  $0.7$  indicates moderate to good agreement, and  $<0.4$  denotes marginal agreement.

Pearson Product Moment (PPM) correlations were used for adolescent-parent reports on usual pain intensity, functional disability, and biopsychosocial perspective, while Spearman correlations were used to examine relationships between individual expectations items and these variables. Paired t-tests were conducted to examine differences between adolescent and parent reports on the same measures. A conservative cut-off value of  $p < 0.01$  was used as criteria for statistical significance for correlations and Kappa to control for multiple tests. All tests were two-sided. Statistical analysis was performed using the Statistical Package for the Social Sciences (SPSS, version 17).

## Results

Table 1 presents demographic data, which is consistent with other pediatric pain specialty clinic samples in the high representation of female, Caucasian adolescents of relatively high SES<sup>26, 31</sup>. Table 2 presents descriptive data for adolescent and parent reports of the adolescent's pain (usual, most and least) intensity, functional disability and each reporter's own biopsychosocial perspective of pain. The sample includes patients with a moderate degree of usual pain intensity and average pain durations exceeding 2 years. Both adolescent and parent reports of functional disability for the adolescent fell in the "moderate" range<sup>26</sup>. Strong correlations were found for adolescent and parent reports of the adolescent's pain ("usual"  $r = .72$ ,  $p < .001$ ; "most"  $r = .53$ ,  $p < .001$ ; and "least"  $r = .73$ ,  $p < .001$ ) and disability ( $r = .80$ ,  $p < .001$ ).

Consistent with our hypothesis, paired t-tests (see Table 2) showed that compared to adolescents, parents reported higher levels of a biopsychosocial pain perspective. This was seen on both the composite ("BIOPSYCH"), variable and the role of feelings and emotions in the pain experience ("EMOTION"), but adolescents and parents did not differ with respect to the role of perceived tissue damage ("DAMAGE"). In addition, results in Table 2 showed that adolescents reported higher levels of "usual" and "most" pain than their parents reported for them, but no adolescent-parent differences existed for reports of "least" pain or adolescent disability.

### Adolescent-parent agreement for treatment expectations

Initial descriptive results regarding treatment expectations showed that both reporters rated the vignette as highly similar to the adolescent's own experience of chronic pain (Adolescent Mean=7.64, SD=2.58; Parent Mean=7.41, SD=2.79). Statistically significant agreement was found for ten of the twenty (50%) treatment-specific items for the recoded data; Kappa's ranged from 0.17–0.37 reflecting "slight" to "fair" levels of concordance<sup>32</sup>. A pattern of stronger agreement emerged for items reflecting alternative (e.g., acupuncture, yoga), emotional (e.g., counseling), behavioral (e.g., attending school), and activity (e.g., OT/PT) focused treatment recommendations. Less agreement was found for items reflecting medical interventions (e.g., medication, surgery) (See Table 3).

Specifically, 82% of adolescents and 74% of parents reported it was either "not at all" or only "a little" likely that the vignette patient would be told surgery was needed to treat the



pain problem. Among adolescents, the treatment recommendations that were most expected included PT/OT (86%), returning to school (73%), pursuing psychological counseling (64%) and learning relaxation techniques (64%). For parents, the most expected treatment recommendations included PT/OT (79%), returning to school (73%), being told that stress may be part of the pain problem (63%) and being referred for more medical tests (63%).

Descriptive results showed that 78% of adolescent and 69% of parent reporters endorsed high levels of hopefulness by the vignette patient and the patient's parent that the pain clinic appointment could help the problem get better. Notably, 50% of adolescents and 49% of parents endorsed that they thought it was either "mostly" or "very" likely that the vignette patient would eventually be cured and no longer have the pain problem. Paired t-tests were conducted to examine differences between adolescent and parent reports on individual treatment expectations items, with three items revealing that parents endorsed higher mean levels than adolescents (see Table 3).

### **Correlations between treatment expectations, pain and disability**

Spearman correlations between individual treatment expectations and adolescent pain intensity were examined. For adolescents, a significant relationship ( $p < 0.01$ ) was found between Item #3 (hopefulness for treatment) and least pain intensity ( $r = .276$ ,  $p = .005$ ). Parent reports showed a significant correlation between Item #19 (additional specialist evaluation) with parent report of the adolescent's usual pain intensity ( $r = .295$ ,  $p = .003$ ).

Correlations between individual treatment expectations and adolescent functional disability were found for adolescent reports on Item #3 (hopefulness for treatment;  $r = .286$ ,  $p = .004$ ), Item #8 (receiving medicine;  $r = .284$ ,  $p = .004$ ) and Item #15 (go to school;  $r = -.273$ ,  $p = .006$ ). Only one significant correlation was found for parent reported treatment expectations and parent reports of adolescent disability on Item #10 (pursue psychological counseling;  $r = .267$ ,  $p = .007$ ).

### **Relationships with biopsychosocial pain perspective**

In order to test our hypothesis that expectations related to psychological and CAM treatment will be positively correlated with a biopsychosocial perspective for both adolescents and parents, Spearman correlations were conducted and presented in Table 4. Multiple significant relationships were revealed for adolescent reports. Among the significant findings, correlations between treatment expectations items and both the composite BIOPSYCH and EMOTION variables occurred for all but Item #16 (learn yoga), which only related to the EMOTION variable. In contrast, none of the expectations items were significantly related to adolescent reports on the DAMAGE variable. For parents, expectations items were most consistently related to endorsement that "Pain is affected by feelings and emotions" (EMOTION) (see Table 4). However, one item (#15, go to school) was found to be related to parent endorsement of the composite biopsychosocial perspective of pain as well as endorsement that "pain always means a part of the body is damaged," (DAMAGE).

## **Discussion**

This study provides a foundation for understanding treatment expectations of adolescents and parents at the time of an initial multidisciplinary pain clinic evaluation. Results document separate adolescent and parent reports of expectations for treatment via a standardized vignette description of an adolescent with chronic pain that was viewed as highly similar to patient's own experience. Consistent with our hypothesis, agreement between adolescent-parent dyad reports for individual treatment expectations was significant

in the “slight” to “fair” range for half of the items assessed, with no significant agreement found for the remaining items. Relationships between individual treatment expectations and pain intensity, functional disability, and biopsychosocial perspective of pain were explored; the most robust associations occurring between expectations items and endorsement of a biopsychosocial perspective of pain. These findings will be considered in greater detail throughout the discussion along with implications for education, treatment and future research aimed at understanding factors related to effectively treating pediatric chronic pain.

Findings supported our expectation that parents would endorse higher levels of a biopsychosocial perspective of pain than adolescents. These findings are consistent with the developmental literature focusing on children’s understanding of pain and illness symptoms that has shown that appreciating the role of emotional and psychological factors can play in the pain experience is the most developmentally complex stage of understanding<sup>33–35</sup>. Alternatively, adolescents in our sample may be reluctant to acknowledge the role of emotions in the pain experience due to concerns that treatment providers may dismiss their symptoms as being “all in your head”<sup>29</sup>. Our prediction that stronger endorsement of a biopsychosocial perspective of pain would be positively correlated with expectations related to psychological and CAM treatments was also generally supported. In addition, a number of interesting findings emerged when we examined patterns of adolescent and parent expectations for treatment. Our descriptive findings showed that the majority of adolescents and parents endorsed high levels of hopefulness by the vignette patient and the patient’s parent that the pain clinic appointment could help the problem get better and that approximately half the adolescents and parents also believed it was likely that the patient would eventually be cured. Collectively, these findings suggest that the initial evaluation contact may be a particularly crucial time to align expectations for treatment in a way that encourages a willingness to pursue psychological/behavioral treatments and that also maintains hope, an important predictor of adjustment for pediatric chronic pain patients<sup>36</sup>, and satisfaction with the treatment process<sup>37–43</sup>.

While adolescent-parent agreement on treatment-specific expectations items was found, it occurred on only half the items and the degree of concordance for significant items fell in the “slight=0–0.20” to “fair=0.21–0.40” range at best<sup>32</sup>. There appeared to be a pattern of stronger agreement on items pertaining to alternative (e.g., acupuncture, yoga), emotional (e.g., counseling), behavioral (e.g., attending school), and activity (e.g., OT/PT) focused treatment recommendations. In contrast, adolescents and parents showed less agreement for medical interventions (e.g., medication, surgery). Inconsistency regarding concordance for child and parent reports within a pediatric pain population has been previously documented<sup>7</sup>. For example, Cohen et al. (2010)<sup>7</sup> report greater child-parent concordance for reports of more observable and shared (e.g., physical disability, family-level functioning) constructs, while greater discordance was seen for “internal experiences” including pain-specific anxiety and depression. Consistent with Cohen et al. (2010)<sup>7</sup> and others<sup>44, 45</sup>, our results showed strong adolescent-parent correlations on reports of adolescent pain intensity and disability. Moreover, the modest level of concordance between adolescent-parent treatment expectations and the lack of concordance on biopsychosocial perspective are not entirely surprising with respect to the findings of Cohen and colleagues<sup>7</sup>; our constructs of “expectation” and “biopsychosocial perspective” would appear to map more closely to an “internal experience” than something readily observable for our sample. These findings would suggest that treatment providers may need to explicitly engage patients and parents in discussion about their expectations and perspectives about pain in order to make this more “internal” information externally accessible to all parties. This information can then potentially be used by providers to provide education in order to help align appropriate pain perceptions and expectations for treatment.



Results further showed that the majority of adolescents and parents thought it was likely that surgery would not be needed to treat the pain problem. The most expected treatments reported by both adolescents and parents were PT/OT and returning to school. Most adolescents also expected recommendations for psychological counseling and learning relaxation, while most parents expected to be told that stress may be part of the pain problem and to be referred for more medical tests. Collectively, our findings suggest that adolescent and parent expectations are generally consistent with the types of recommendations made in our clinic setting. This finding is not entirely surprising with respect to the fact that information provided to families in the introductory letter that preceded their initial evaluation stated many of these treatment recommendations by name. This may suggest that providing families with a preliminary introductory letter can help to set appropriate expectations for treatment and provide a vehicle to help families to ask questions and more readily collaborate in treatment planning during the initial evaluation. Future research is needed to test the specific role that presence or absence of information in an introductory letter may play in shaping the treatment encounter and later outcomes since all participants received the same introductory letter in this study. Finally, we note that concordance on these items showed only “slight” to “fair” levels of between-reporter similarity, with the strongest shared expectations relating to recommendations to return to school, pursue psychological counseling, and engage in PT/OT treatment.

Researchers have previously asserted that additional education aimed at enhancing treatment expectations regarding CAM among children with chronic pain and their parents is warranted<sup>12</sup>. Within outpatient mental health settings, poor child and parent agreement about the child’s target problem contributes to poorer outcomes for new referrals<sup>46</sup> and parents with less accurate expectations about pediatric psychotherapy were found to be more likely to prematurely terminate their children’s treatment<sup>9</sup>. In addition, positive treatment expectations have been proposed as a potential explanation of placebo effects<sup>47</sup>. Within a pediatric chronic pain population, positive treatment expectations have been found to be associated with better treatment adherence in general and for psychological recommendations in particular<sup>5</sup>. Collectively, these findings would suggest that efforts to enhance adolescent-parent treatment expectations, as well as agreement about these expectations, may help improve adherence and outcomes. Future prospective research is needed to increase our understanding of how treatment expectations may ultimately relate to improved treatment outcomes for pediatric chronic pain patients.

Educating patients, as well as their treatment providers, about the biopsychosocial model may also improve treatment outcomes for patients with chronic pain. Researchers have considered the importance of educating healthcare providers about the biopsychosocial perspective and effective communication related to it as a means of shaping beliefs and attitudes about chronic pain which may in turn affect patient outcomes<sup>48</sup>. For example, Domenech et al. (2011)<sup>49</sup> examined the effectiveness of two brief educational modules with either a biomedical or biopsychosocial orientation in changing the beliefs and attitudes of physical therapy students and the recommendations that they gave to patients. Results supported that a strictly biomedical education orientation exacerbated student’s maladaptive beliefs, and consequently resulted in inadequate activity recommendations being made to patients<sup>49</sup>. Our current findings support that greater adolescent and parent endorsement of a biopsychosocial perspective of pain is correlated with stronger expectations that depression, anxiety, and stress play a role in the pain problem and that treatments such as relaxation and yoga may be beneficial. While Crushell and colleagues found support for the importance of parent acceptance of a biopsychosocial model of pain in patient outcomes<sup>18</sup>, much remains unknown about the potential to educate and positively influence patient and parent beliefs and treatment expectations at the initial pediatric pain clinic encounter. For example, future research should examine whether there is any systematic relationship between expectations

and what patients and parents were told by their referral source, as this may differ as a function of the provider's particular specialization and/or the availability of specific types of treatments provided by pain clinic. Additional research is needed to examine the role that education for pediatric patients, parents and providers about the biopsychosocial model of pain may play in influencing treatment expectations and to provide empirical evidence linking these expectations to treatment adherence and outcomes.

Some limitations to this study are important to consider. The study was primarily exploratory and the cross sectional nature of the data limits our ability to understand causal links among variables. There was also limited ethnic/racial diversity in our sample, primarily composed of female adolescents and their mothers, which may limit the ability to generalize these findings. Information provided to families in the introductory cover letter or by their referring provider may have biased expectations; these factors were not assessed in this study. For example, based on this information some families may have chosen to not participate in our program. Thus, our sample may reflect a bias toward families who are more generally open to a multidisciplinary, biopsychosocial approach to pediatric pain treatment than exist in community or non-referred patients with chronic pain. Additionally, our use of adolescent and parent responses to a standardized vignette to indirectly elicit treatment expectations may not accurately reflect the adolescent and parents own expectations of treatment for the adolescent. However, we note that this concern is mitigated by our findings that adolescents and parents viewed the description of the vignette character to be highly similar to the adolescent's own experience. Future efforts to develop and validate a pediatric measure to directly assess beliefs related to a biopsychosocial perspective of pain and treatment expectations is warranted and may benefit from information gleaned from efforts advanced in the adult chronic pain literature<sup>50</sup>. Finally, we did not assess participants' existing knowledge of/familiarity with treatments listed on the expectations questionnaire, so we are unable to examine whether these factors may have potentially influenced our findings related to treatment expectations.

Despite these limitations, the current study provides an important initial effort to document and better understand relationships between adolescent and parent treatment expectations at the time of an initial pain clinic evaluation. We found modest levels of agreement between adolescent-parent dyad reports for half of the individual treatment expectations assessed, perhaps because these expectations reflect more private, internal perspectives that are not overtly expressed or discussed within families. Few relationships were found between individual treatment expectations and reports of pain intensity and functional disability. However, as predicted, we found that parents more strongly endorsed a biopsychosocial perspective of pain than adolescents and that expectations related to psychological and CAM treatments were positively related to the endorsement of a biopsychosocial perspective of pain for both adolescents and parents. While these findings require replication in other pediatric pain samples, they can help inform future hypotheses and prospective research efforts to enhance positive treatment outcomes for chronic pediatric pain patients and their families.

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**Table 1**

## Demographic variables

	Mean or n	(SD) or %
Adolescent Age	15.7	(1.4)
Adolescent Gender: Females	81	79.4%
Adolescent Ethnicity: Caucasian	90	88.2%
Adolescent Grade in School	9	1.48
Adolescent Pain Duration in Months	27.2	(27.4)
Parent Participant: Mother	91	89.2%
Doctor's Office Visits for Pain in Past Year (raw count)	15.5	(18.3)
Number of Persons Living in the Home	4.4	(1.0)
Family SES (Hollingshead Scale)	49.5	(10.7)
Adolescent Pain Diagnostic Category		
Diffuse Musculoskeletal Pain	38	37.3%
Complex Regional Pain Syndrome (CRPS)– Type1	25	24.5%
Localized Musculoskeletal Pain	27	26.5%
Back Pain	3	2.9%
Chest or Torso Pain	2	2.0%
Intermittent Musculoskeletal Pain – Diffuse	4	3.9%
Intermittent Musculoskeletal Pain – Localized	3	2.9%



**Table 2**

Descriptive data and mean comparisons for pain, disability and biopsychosocial perspective of pain

Measure	Adolescent Report n=102		Parent Report n=102		Paired t-tests
	M	SD	M	SD	t (df)
<b>Pain Intensity (0–100mm VAS scale)</b>					
Usual Pain	59.17	22.06	54.72	22.72	2.72** (99)
Most Pain	85.02	18.3	80.78	20.48	2.40* (99)
Least Pain	35.35	22.21	39.28	23.98	–1.85 (99)
<b>Functional Disability (FDI)</b>					
	25.65	11.95	24.19	12.54	1.88 (101)
<b>Biopsychosocial perspective of pain</b>					
BIOPSYCH (range 0–20)	11.97	3.66	13.39	2.69	–2.92** (101)
DAMAGE (range 0–10)	3.98	3.04	4.25	2.96	–0.74 (101)
EMOTION (range 0–10)	5.95	2.68	7.65	2.10	–5.48** (101)

\* p .05,

\*\* p .01

**Table 3**

Treatment-specific expectations items, descriptive data, and agreement statistics

		Individual Item		Item Response Categories							
		Mean (SD)		Paired t-test t (df=101)	0 (Not at all, A little)		1 (Some)		2 (Mostly, Very)		Kappa (signif.)
Treatment Expectation Items		Adolescent	Parent		Adolescent	Parent	Adolescent	Parent	Adolescent	Parent	
1. How hopeful is Mary that the pain clinic appointment will help her pain problem get better?		2.35 (1.19)	2.55 (1.08)	-1.34	25%	17%	29%	35%	45%	48%	.14 (0.05)
2. How hopeful is/are Mary's parent(s) that the pain clinic appointment will help Mary's pain problem get better?		3.19 (.95)	3.02 (.94)	1.45	8%	6%	14%	25%	78%	69%	.09 (0.22)
3. How likely is Mary to be told that there are treatments to help her manage her pain problem?		2.63 (.96)	3.08 (.84)	-3.94**	15%	3%	28%	23%	58%	75%	.22 (0.00)
4. How likely is Mary to eventually be cured and to no longer have her pain problem?		2.43(.97)	2.49 (.90)	-52	18%	11%	32%	40%	50%	49%	.03 (0.70)
5. How likely is Mary to receive a medical diagnosis for her pain problem?		2.78 (1.00)	2.63 (.99)	1.27	13%	15%	25%	25%	63%	61%	.13 (0.09)
6. How likely is Mary to be told that she is experiencing signs of depression?		2.37 (1.30)	2.39 (1.19)	-15	20%	24%	30%	24%	50%	53%	.22 (0.00)
7. How likely is Mary to be told that she is experiencing signs of anxiety?		2.23 (1.22)	2.39 (1.06)	-1.23	20%	26%	34%	30%	46%	44%	.05 (0.45)
8. How likely is Mary to be given medicine for her pain problem?		2.53 (1.18)	2.26 (1.21)	1.77	29%	21%	30%	25%	40%	55%	.04 (0.55)
9. How likely is Mary to be told she should pursue physical therapy (PT) or occupational therapy (OT) for her pain problem?		3.18 (.91)	3.36 (.73)	-1.78	1%	5%	12%	16%	86%	79%	.22 (0.01)
10. How likely is Mary to be told she should pursue psychological counseling for her pain problem?		2.30 (1.26)	2.69 (1.11)	-2.85**	17%	28%	20%	23%	64%	50%	.30 (0.00)
11. How likely is Mary to be told that surgery is needed for her pain problem?		0.91 (.92)	0.81 (.79)	.94	82%	74%	15%	21%	3%	6%	.11 (0.19)
12. How likely is Mary to be told she should learn relaxation techniques to help her pain problem?		2.64 (1.17)	2.89 (.94)	-1.97	7%	16%	29%	25%	64%	60%	.05 (0.52)
13. How likely is Mary to be told she should pursue biofeedback treatment for her pain problem?		1.86 (1.03)	2.17 (1.04)	-2.56*	22%	33%	46%	40%	32%	26%	.17 (0.01)
14. How likely is Mary to be told she should pursue acupuncture treatment for her pain problem?		1.60 (1.20)	1.67 (1.09)	-53	42%	47%	35%	31%	23%	22%	.22 (0.00)
15. How likely is Mary to be told that she should go to school even though she has pain?		2.81 (1.20)	2.96 (1.12)	-1.33	11%	16%	17%	12%	73%	73%	.37 (0.00)

	Individual Item			Item Response Categories						Kappa (signif.)
	Mean (SD)		Paired t- test <i>t</i> ( <i>df</i> =101)	0 (Not at all, A little)		1 (Some)		2 (Mostly, Very)		
	Adolescent	Parent		Adolescent	Parent	Adolescent	Parent	Adolescent	Parent	
Treatment Expectation Items										
16. How likely is Mary to be told she should learn and practice yoga to help her pain problem?	1.82 (1.19)	2.15 (1.17)	-2.56*	24%	43%	41%	25%	35%	32%	.18 (0.01)
17. How likely is Mary to be told that stress may be part of her pain problem?	2.75 (1.21)	2.58 (1.19)	1.41	16%	17%	29%	21%	55%	63%	.21 (0.00)
18. How likely is Mary to be told she should pursue massage therapy for her pain problem?	2.14 (1.11)	2.16 (1.12)	-.16	26%	29%	39%	32%	35%	38%	.25 (0.00)
19. How likely is Mary to be referred for an evaluation by another medical specialist to help clarify her diagnosis?	2.53 (1.15)	2.35 (1.18)	1.15	25%	17%	31%	32%	44%	51%	.01 (0.91)
20. How likely is Mary to be referred for more medical tests to help clarify her diagnosis?	2.74 (1.11)	2.50 (1.12)	1.67	18%	16%	31%	22%	51%	63%	.11 (0.12)

Note.

\* p .05,

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p<.01; Percentages within cells reflect the percent of adolescents or parents that endorsed each item response category.

**Table 4**

Significant correlations between psychosocially-oriented and CAM treatment expectations and biopsychosocial pain perspective items for adolescents and for parents

Treatment Expectation Items	Biopsychosocial Perspective of Pain Variables					
	BIOPSYCH		EMOTION		DAMAGE	
	Adolescent	Parent	Adolescent	Parent	Adolescent	Parent
6. How likely is Mary to be told that she is experiencing signs of depression?	.373**		.457**	.430**		
7. How likely is Mary to be told that she is experiencing signs of anxiety?	.357**		.420**	.406**		
10. How likely is Mary to be told she should pursue psychological counseling for her pain problem?	.281*		.286*			
12. How likely is Mary to be told she should learn relaxation techniques to help her pain problem?	.319**	.270*	.413**	.284*		
13. How likely is Mary to be told she should pursue biofeedback treatment for her pain problem?	.362**		.387**			
14. How likely is Mary to be told she should pursue acupuncture treatment for her pain problem?	.327**		.266*			
15. How likely is Mary to be told that she should go to school even though she has pain?		.324**				-.272*
16. How likely is Mary to be told she should learn and practice yoga to help her pain problem?		.260*	.307*	.316**		
17. How likely is Mary to be told that stress may be part of her pain problem?	.402**	.306*	.542**	.477**		
18. How likely is Mary to be told she should pursue massage therapy for her pain problem?	.303*		.431**			

\*  
p .01,

\*\*  
p .001