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The Importance of Family Environment in Pediatric Chronic Pain

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The impact of chronic pain during childhood and adolescence has been well described (e.g.,[1]). A subset of youth with chronic pain has high levels of anxiety and depressive symptoms, poor quality of life, and impairment in school and activity participation ([2–4]). Moreover, pain impacts the entire family. Parents of children with chronic pain report increased parenting stress, anxiety and depressive symptoms, financial strain, and family dysfunction ([5–6]). Parents also play a critical role in their child's ability to adapt to living with chronic pain, both in terms of their child's emotional functioning as well as their child's ability to participate in activities of daily life. For example increased parent psychological distress is recognized as a risk factor for poorer outcomes in youth with chronic pain ([5,7]). A bidirectional relationship between parent and family factors (e.g., parental responses to pain behavior; family environment) and children's pain experience has been described where parent and family factors may increase risk for pain and disability, and in turn, pain and disability may impact parent and family life ([8]).

Contemporary research in pediatric pain has focused on the identification of risk factors associated with presence and development of chronic pain as well as longitudinal risk. Such investigations have explored a range of biological, social, and psychological risk factors (e.g.,[9–10]). Findings from the study by Hoftun and colleagues published in this issue of *Archives* contribute to this body of literature. Using an innovative family linkage study design, their findings revealed that maternal and paternal chronic pain increased the odds of chronic pain in adolescents. Associations were even stronger when both parents reported chronic pain. Several family and psychosocial correlates were examined including the structure of the family living situation. Associations in chronic pain status were strongest among adolescents living exclusively with their mother, or their mother and her new partner.

These findings raise important questions about the role of the family environment in pediatric pain. The family environment encompasses a range of variables including individual parent behaviors, dyadic interactions between family members, and the broader family system including socioeconomic conditions, family structure, family functioning, and culture. In their integrative model describing parent and family factors in pediatric pain, Palermo and Chambers[8] highlight the association between different levels of the family system and child pain and disability. For example, at the level of the individual parent, parental emotions, behaviors, and health may play a role in the child's pain experience with overly protective behaviors, increased distress, and history of chronic pain being important

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parent-level influences. A distinction is made in the model between factors that are predictive of pain versus factors that are predictive of the child's level of disability.

Pertinent to the study published in this issue by Hoftun and colleagues, a key question not addressed concerns the level of pain-related functional impairment experienced by adolescents (and parents) in the sample. Pain and disability can vary considerably among children with pain, and therefore, the assessment of functional impairment is important in order to define severity and impact of pediatric chronic pain. Prior research indicates that only a small subset of youth with chronic pain (approximately 5%) experience moderate-severe disability[11]. While the assessment of pain severity is important in the context of the family environment, different predictors have been associated with pain presence versus pain-related disability. For example, in a systematic review of studies of family functioning in youth with chronic pain, much stronger associations were found between family dysfunction and disability in contrast to more limited associations between family dysfunction and pain[6]. Future research incorporating measurement of patterns of disability in both parents and adolescents will be important to understanding how the family environment is associated with youth functioning across different domains (e.g., school attendance, activity participation).

Hoftun and colleagues' research also suggests that family structure may play a role in either development or maintenance of chronic pain. In their study, associations between parent and adolescent pain were strongest in adolescents living primarily with their mothers. Was family structure a proxy for additional variables not captured in the current study? While Hoftun and colleagues collected data on education, socioeconomic status, and family structure, the study did not include measurement of other elements of the family, such as overall level of family functioning or dyadic interactions between parents and adolescents. It is unknown why adolescents living with both parents had lower rates of chronic pain, while adolescents living primarily with their mothers had higher rates of chronic pain and stronger associations with maternal pain. Perhaps mothers in these living situations had higher levels of parenting stress or family functioning was poorer overall. Additional research is needed to provide a more comprehensive assessment of the family in order to understand how family structure may relate to other key aspects of family function (such as level of organization, cohesion, communication, affective environment, and problem solving)[12]. Well-validated self-report and observational tools are available for measuring family variables (see review[12]) in other pediatric populations that could be applied to families of youth with chronic pain.

One strength of the study by Hoftun and colleagues is the inclusion of maternal, paternal, and adolescent report. There has been a general lack of inclusion of fathers in research on chronic pain in children. Further inclusion of fathers in pediatric pain research will allow for the examination of potential differences in how mothers and fathers respond to adolescent pain complaints, and how dyad-partner interactions impact both the marital relationship and broader family functioning.

The study of family environment in adolescence could also be strengthened through consideration of the developmental context. Rates of pain and pain-related disability are higher during adolescence compared to any other developmental stage of childhood (e.g.,[13]). Moreover, many social changes occur during adolescence including achieving autonomy or independence from parents, and may be associated with parent and adolescent reported stress as well as psychological symptoms. Balancing parental involvement and autonomy is a complex issue for adolescents with medical conditions. In our own work in adolescents with chronic headache, we found that higher levels of family conflict and lower levels of adolescent autonomy were associated with increased functional impairment and increased symptoms of depression ([7]) in youth. Developmental considerations will be important to furthering the study of family environment in pediatric chronic pain, and in examining longitudinal associations among pain in parents and children to understand potential changes over time and across developmental stages.

Last, the family environment is critical to consider in behavioral interventions to address pain and disability in adolescents. In general, cognitive-behavioral pain interventions have included parent strategies focused on operant techniques (e.g., minimizing response to pain complaints, encouraging adaptive behavior) taught to parents in brief individual or group sessions. For example, seven of 25 randomized controlled trials (RCTs) included in a recent meta-analysis of psychological therapies for the treatment of pediatric chronic pain incorporated operant intervention strategies directed to parents[14]. Results revealed that including parent-focused interventions had positive effects on pain reduction in children and adolescents. In contrast, existing behavioral interventions for children with chronic pain have no effect on parent outcomes such as psychological distress[15].

A focus on the development of family and parent interventions for youth with chronic pain should be a research priority. To date, there has been limited development of intervention content directed at other aspects of the family environment such as parent modeling or family conflict. Based on the findings of Hoftun and colleagues, development and testing of interventions that provide instruction to parents in modifying their own response to their chronic pain (e.g., modeling) will be an important next step.

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