Brief Report: The Association Between Peer Victimization, Prosocial Support, and Treatment Adherence in Children and Adolescents with Inflammatory Bowel Disease

David M. Janicke, Wendy N. Gray, Nicole A. Kahhan, BA, Katherine W. Follansbee Junger, BA, Kristen K. Marciel, Eric A. Storch, PhD, and Christopher D. Jolley, MD

Department of Clinical and Health Psychology, University of Florida, Department of Psychology, University of Miami, Department of Pediatrics and Psychiatry, University of South Florida, and Department of Pediatrics, University of Florida

Objective  To examine the relationship between peer victimization, prosocial support, and treatment adherence in children and adolescents with Inflammatory Bowel Disease (IBD).

Method  Thirty-eight children diagnosed with IBD, between the ages of 7–19 years, and their parents were recruited from an outpatient Gastroenterology Clinic. Each child completed the Social Experience Questionnaire. The child, parent, and treating physician completed a one-item measure of medication adherence. Results  Child reported positive social interactions moderated the relationship between child reported peer victimization and self-reported medication adherence ($t = -2.09; p = .045$). These relationships held when parent report of child adherence was substituted for child reported adherence in this model ($t = -2.37; p = .024$). Conclusions  The findings from this pilot study suggest that prosocial support may buffer children with IBD from experiencing the more negative effects of peer victimization on treatment adherence and highlight the importance of social interactions in youth with IBD. Implications for treatment are discussed.

Key words  adherence; children; inflammatory bowel disease; peer victimization; social support.

Inflammatory bowel disease (IBD) is a chronic and unpredictable disease of uncontrolled intestinal inflammation. Affecting approximately nine in 100,000 children, IBD is characterized by periods of disease activity and remission, frequent diarrhea, weight loss, abdominal pain, short stature and delayed puberty (Lindberg, Lindquist, Holmquist, & Hildebrand, 2000). Treatment for pediatric IBD varies depending on disease course and severity, but can include a complex and burdensome regimen of multiple medications (e.g., systemic corticosteroids, immunomodulators), dietary restrictions, and surgery (Hommel, Davis, & Baldassano, 2008). Steroids that are commonly used to treat inflammation have been associated with numerous side effects including weight gain, facial swelling, and emotional lability (Mackner, Crandall, & Szigethy, 2006; Rabbett et al., 1996). Children with IBD and their parents have reported concerns with the burden and side effects associated with the treatment regimen (Akobeng et al., 1999; Rabbett et al., 1996). Given the complicated nature of disease management and the uncomfortable side effects that may result, it is not surprising that poor treatment adherence has been reported among children with IBD (Mackner & Crandall, 2005; Rabbett et al., 1996). As treatment adherence is related to quality of life among children with IBD (Hommel et al., 2008), determining factors that are associated with adherence is critical.

Many studies have examined the role that peer relationships play in treatment adherence in pediatric chronic illnesses. Specific processes of interest often include peer victimization and prosocial support. Peer victimization is a widespread problem among youth, with one in five children experiencing chronic emotional, verbal, or physical attacks by peers (Storch & Masia-Warner, 2004). Peer victimization in children has been linked to depression, poor psychosocial adjustment, and lower rates of physical
activity (Gray, Janicke, Ingerski, & Silverstein, 2008; Storch et al., 2006), as well as poorer treatment adherence in children with chronic health conditions (Storch et al., 2006). On the other hand, peer support may have more positive effects. While research examining the link between peer support and overall treatment adherence in pediatric chronic illness is mixed, peer support does appear to be linked to better psychosocial adjustment, as well as better adherence to specific aspects of treatment regimens (Bearman & LaGrecia, 2002). Moreover, close support from friends has also been found to buffer the impact of stressors in children (LaGrecia et al., 1995). Given these relationships, it is possible that having positive peer support may help offset the negative aspects of peer victimization by moderating the relationship between peer victimization and medication adherence.

Unfortunately, many children with chronic health conditions are at increased risk of peer victimization since disease symptoms or treatment regimens may lead peers to perceive them as different (Hugh-Jones & Smith, 1999; Storch & Masia-Warner, 2004). These differences may be particularly salient among youth with IBD, where frequent trips to the bathroom, the need to take medications during the school day, short stature, special diets, and a limited ability to participate in normative social activities may attract negative attention from peers (Mackner & Crandall, 2005, 2006; Mackner, Crandall, & Szigethy, 2006). In fact, previous studies have reported that family members of pediatric IBD patients see the social interactions of these youth as being particularly problematic (Akobeng et al., 1999; Mackner & Crandall, 2006). Perceptions of victimization and positive support may have important implications on treatment adherence for children with IBD. However, these relationships have not been examined in children with IBD.

This pilot study assesses the relationship between peer victimization, prosocial support, and medication adherence in children with IBD. It was hypothesized that greater levels of victimization would be associated with poorer treatment adherence. Furthermore, we hypothesized that prosocial support would moderate the relationship between victimization and adherence, such that higher support would buffer against the negative effects of higher levels of victimization on medication adherence.

**Method**

**Participants**

Thirty-eight children were recruited over 1.5 years. Children were ages 7–19 years ($M = 14.5, SD = 3.3$) and predominantly Caucasian (74%), with smaller percentages identified as Hispanic (13%), African American (8%), or other (5%). Slightly more males (55%) than females participated in the study. Legal guardians were predominantly mothers (77%), with fathers (13%), grandparents (3%), step-parents (3%), and other guardians (4%) comprising smaller percentages of the sample. Seventy-five percent of legal guardians were married. Median family income was $50,000.

**Procedure**

This study was approved by the governing IRB and was a part of a larger study examining psychosocial functioning of children with IBD. Participants were children with IBD (ages of 7–19 years) and their parent/legal guardian. All participants were recruited in private exam rooms while attending scheduled appointments in a pediatric gastroenterology clinic. Three families declined to participate due to time considerations. After obtaining informed consent, participants individually completed questionnaire packets.

**Measures**

**Child, Parent, and Clinician Estimate of Adherence**

Child, parent, and physician estimate of adherence were obtained via a single item. Each was asked to select one of four statements that best described the child’s overall frequency of medication use [e.g., I/My child (rarely, sometimes, mostly, always) take my/their medications as prescribed], with higher scores indicating better adherence.

**Social Experience Questionnaire**

The Social Experience Questionnaire (SEQ) is a 15-item child-report measure of peer victimization and prosocial support with three subscales: overt victimization, relational victimization, and prosocial support (Crick & Grot Peters, 1992). Each scale consists of five items rated on a 5-point Likert scale. Higher scores correspond to greater support or greater victimization. Total victimization (overt + relational) and prosocial support subscales were used in this study. Examples of items on the victimization scale include “how often does another kid try to keep others from liking you by saying mean things about you?” and “how often do you get hit by another kid at school?” Examples of items on the support scale include, “how often does another kid try to cheer you up when you feel sad or upset?” and “how often does another kid give you help when you need it?” The SEQ has strong concurrent validity with measures of adjustment (Crick & Grot Peters, 1996). Cronbach’s $\alpha$ for the total victimization scale ($\alpha = .88$) and prosocial...
The interaction term. Interpretation of moderators was the final block. Variables were centered prior to creating interaction of victimization and peer support was entered in the second block, and the variables (i.e., child, parent, and clinician report) following guidelines by Holmbeck (1997). Significant control variables were entered in the first block, peer victimization and prosocial support (Figure 1). Prosocial support did not moderate the relationship between victimization and physician estimate of adherence (t = -2.79, p < .01) and low (t = -2.66, p < .05) levels of prosocial support. For parent reported adherence, post-hoc probing revealed significant moderating relationships for both high (t = -2.79, p < .01) and low (t = -2.68, p < .05) levels of prosocial support (Figure 1). Prosocial support did not moderate the relationship between victimization and physician estimate of child adherence.

Demographics of the Sample
The majority of children were diagnosed with Crohn’s disease (59%) or ulcerative colitis (36%). Disease activity was as follows: quiescent (39%), mild symptoms (31%), exacerbations of at least moderate severity (23%), and chronically active moderate/severe (8%). A majority of children were being treated with steroids (69%). The relationship between child demographic variables (i.e., child race, sex, and gender), and medication adherence and peer interactions variables were examined to determine if data could be collapsed across the sample. Child demographic variables were not significantly related to medication adherence, and thus were not included as control variables in the regression analyses.

Results
Demographics of the Sample
The majority of children were diagnosed with Crohn’s disease (59%) or ulcerative colitis (36%). Disease activity was as follows: quiescent (39%), mild symptoms (31%), exacerbations of at least moderate severity (23%), and chronically active moderate/severe (8%). A majority of children were being treated with steroids (69%). The relationship between child demographic variables (i.e., child race, sex, and gender), and medication adherence and peer interactions variables were examined to determine if data could be collapsed across the sample. Child demographic variables were not significantly related to medication adherence, and thus were not included as control variables in the regression analyses.

Gastroenterologist Report of Patient Health Status and Treatment
The physician completed a form outlining IBD subtype (Crohn’s, ulcerative colitis, indeterminant), disease activity (quiescent, mild symptoms only, exacerbations of at least moderate severity with remissions, chronically active moderate/severe disease), and current steroid treatment (yes/no). Significant control variables following guidelines by Holmbeck (1997). Significant control variables were entered in the first block, peer victimization and prosocial support (yes/no).

Data Analyses
Correlation analyses were used to examine the relationships among child age and race, and medication adherence. Independent t-tests were used to identify sex differences in medication adherence. If a significant relationship was found, the variable(s) was entered as the first block in the regression analysis. Three hierarchical regressions were conducted to examine if prosocial support moderated the relationship between peer victimization and adherence (i.e., child, parent, and clinician report) following guidelines by Holmbeck (1997). Significant control variables (see above) were entered in the first block, peer victimization and prosocial support in the second block, and the interaction of victimization and peer support was entered as the final block. Variables were centered prior to creating the interaction term. Interpretation of moderators was conducted via post-hoc probing (Holmbeck, 2002).

Estimates of Medication Adherence, Peer Victimization, and Prosocial Support
Child-report (M = 2.4, SD = 0.6), parent-report (M = 2.5, SD = 0.7), and physician report (M = 2.4, SD = 0.7) of child adherence to treatment was high. Child report of medication adherence was significantly correlated with parent (r = .61, p < .01) and clinician (r = .42, p < .05) reported adherence, while parent estimate of adherence was associated with clinician reported adherence (r = .45, p < .01). Mean child reported peer victimization and prosocial support were 15.7 (SD = 7.6) and 18.9 (SD = 4.5), respectively.

Relationship between Peer Victimization and Medication Adherence
Overall, peer victimization was negatively associated with child report of medication adherence (r = -0.39, p < .05) such that higher levels of victimization were associated with lower adherence. Medium, but non-significant correlations, were noted for parent report of medication adherence with prosocial support (r = .31) and peer victimization (r = -.32).

Prosocial Support as a Moderator of the Association between Peer Victimization and Adherence
Results of the moderation analyses for both child and parent report of child adherence were significant for the overall model, as well as for the interaction terms in block 2 (see Table 1). Post-hoc probing revealed significant moderating relationships between peer victimization and child reported adherence for both high (t = -2.92, p < .01) and low (t = -2.66, p < .05) levels of prosocial support. For parent reported adherence, post-hoc probing revealed significant moderating relationships for both high (t = -2.79, p < .01) and low (t = -2.68, p < .05) levels of prosocial support (Figure 1). Prosocial support did not moderate the relationship between victimization and physician estimate of child adherence.

Discussion
This study extends the literature on medication adherence and peer relationships in children with IBD by suggesting that child perceptions of prosocial support moderate the relationship between child perceptions of peer victimization and medication adherence. Specifically, for both parent and child report of child adherence, when social support was high, there was relatively little difference in parent and child reported medication adherence based on the degree of peer victimization. However, when social support was low, medication adherence dropped as peer support.
victimization increased. Although speculative, experiences of peer victimization may leave children embarrassed to complete illness management tasks, or may cause them to refuse to take medication due to side effects that invite potential ridicule from peers. Alternatively, poor adherence may impact health or psychological status, which can contribute to poorer peer interactions. However, having supportive friends may provide a safe haven for completing illness management tasks (Bearman & LaGreca, 2002) or emotional support that may lessen the impact of hurtful peer interactions. Prospective research using sociometric techniques to assess peer relationships (Mackner & Crandall, 2005) and multimethod assessment of adherence (Hommel et al., 2008) is warranted to further verify and elucidate these relationships.

A limitation of this study is that we used a single item, subjective measure to assess child adherence from the perspective of the child, parent, and physician. This strategy does not provide an objective measure of adherence, but rather a subjective “estimate” of adherence. Thus, it can be influenced by social desirability and may provide an overestimate of adherence. The high level and restricted range of medication adherence reported in this study suggests that this may have occurred in this sample. An additional limitation is that this study employed a cross-sectional design which does not allow for determination of causality.

A third limitation is that we included only a modest number of children who were fairly high functioning, with low mean levels of perceived peer victimization, low levels of disease activity, and high levels of medication adherence. The restricted range of these variables limits the generalizability of our results. However, previous studies using multiple methods to measure medication adherence in children with IBD found that that disease activity was not related to medication adherence (Hommel et al., 2008). Moreover, the fact that a

![Figure 1: Prosocial support moderating the relationship between peer victimization and medication adherence.](https://academic.oup.com/jpepsy/article-abstract/34/7/769/907025)
A statistically significant association was found between these variables despite the restricted range of data points to the importance of further research in this area as the current results may be a conservative estimate of the relationships under study. Finally, we did not assess the potential impact of other psychosocial variables on medication adherence. The role of depression may be a particularly salient and an important area for future research, given the link between depressive symptoms and peer victimization (Storch & Masia-Warner, 2004).

The current results, while preliminary, provide data supporting an association between peer interactions and medication adherence in children with IBD. Health professionals should be alert to the potential role that positive and negative peer interactions can exert in youth with IBD.

**Conflicts of interest:** None declared.

**References**


