

THE ASSOCIATION BETWEEN PEDIATRIC PEER VICTIMIZATION AND HEALTH
CARE COSTS

By

NICOLE A. KAHHAN

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Nicole A. Kahhan.

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Peer victimization has been linked to a myriad of negative psychosocial outcomes, psychosomatic symptoms, and health problems in children. No research has been done, however, to examine whether the experience of peer victimization is related to health care expenditures. Currently only 30-40% of the variance in children's health care use has been accounted for, with family variables, demographics, and child mental/physical health status represented. The purpose of this study was (1) to determine if peer victimization was related to health care utilization (specifically acute care costs); and (2) to determine if this relationship was mediated by child or guardian reported psychosocial variables, or the presence of a mental health diagnosis. Participants were 213 children enrolled in Medicaid, ages 7-15, and their guardian(s), recruited from pediatric primary care clinics. Guardians completed a demographic form and the Child Behavior Checklist (CBCL). Children completed the Social Experience Questionnaire (SEQ) and the Pediatric Quality of Life Inventory (PedsQL). Health care expenditures and previous mental health diagnosis were extracted from the Medicaid database. Child perception of peer victimization was significantly related to acute care costs. Moreover, total child behavioral and emotional problems as measured by the CBCL, child report of quality of life, and presence of a mental health diagnosis each mediated the relationship between peer victimization and health

care costs. These data suggest that peer victimization may lead to an increase in health care costs, and child behavioral and emotional functioning may create an important pathway leading to increased acute medical care. Given that current health care use patterns are predictive of future use, further elucidating the relationship between peer victimization and health care use may provide insight into potential points of intervention to decrease children's medical costs.

CHAPTER 1 INTRODUCTION

Children often experience peer victimization, an occurrence which typically involves repeated exposure to forms of aggression perpetrated by others, and may involve a real or perceived power imbalance between a bully and a victim (Crick & Bigbee, 1998; Jacobs, 2007; Storch & Ledley, 2005). Peer victimization exists in many overt and covert forms (Hayden-Wade, Stein, Ghaderi, Saeles, et al., 2005; Janssen, Craig, Boyce, & Pickett, 2004; Puhl & Latner, 2007; Storch & Ledley, 2005). Overt forms include acts which harm others through physical damage, or the threat of such harm (e.g. pushing, hitting, or kicking), while covert forms are relational and involve hurtful manipulation of relationships or friendships (e.g. gossiping, teasing, or excluding). Both of these types of victimization may do social and psychological harm (Crick & Bigbee, 1998; Hawker & Boulton, 2000; Puhl & Latner, 2007; Putallaz, Grimes, Foster, Kupersmidt, et al., 2007).

As many as 30-51% of school-aged children experience these chronic emotional, verbal, or physical attacks by peers (Bond, Carlin, Thomas, Rubine, Patton, 2001; Nansel Overpeck, Pilla, Ruan, et al., 2001; Storch, Brassard, & Masia-Warner, 2003, Wolke, Woods, Bloomfield, & Karstadt, 2001), with victimization occurring cross-nationally in over 25 countries (Nansel, Craig, Overpeck, Saluja, & Ruan, 2004). Victims across these countries are more likely than their non-victimized peers to experience subsequent health problems, as well as poorer emotional and social adjustment (Nansel, et al., 2004). Some groups of children are particularly at risk for victimization, including those belonging to chronic illness groups (Fekkes, Pijpers, Fredriks, Vogels, & Verloove-Vanhorick, 2005; Van Cleave & Davis, 2006). These children may exhibit observable behaviors that mark them as different, such as adherence behaviors, which have been seen as negatively effected by victimization (Janicke, Gray, Kahhan, Follansbee, Marciel,

Storch, & Jolley, 2008; Storch & Ledley, 2005). Children with chronic health conditions may also have observable characteristics such as a high weight status or short stature, which may invite victimization (Janicke, et al., 2008; Storch & Ledley, 2005). Children with social skills deficits or those who are socially isolated, may also elicit higher amounts of victimization (Putallaz et al., 2007; Nansel et al., 2001). Internalizing and externalizing conditions and behaviors are more likely in victimized children (Due, Hansen, Merlo, Anderson & Holstein, 2007; Olweus, 1994; Storch & Ledley, 2005). Previous literature however is mixed between viewing the majority of these factors as either antecedents or consequences to victimization (e.g. Olweus, 1994; Bond et al., 2001).

Psychosocial adjustment problems have been associated with victimization in both boys and girls (Crick & Bigbee, 1998). However, boys and girls often experience different types of victimization and exhibit different reactions to these experiences (Storch & Ledley, 2005). Covert, or relational victimization, appears to be more common among girls. Alternatively overt, or physical victimization, is more common among boys (Crick & Bigbee, 1998; Nansel et al., 2001; Putallaz et al., 2007). With regards to how victimization is experienced and interpreted, girls often see bullying as an attack on their physical appearance and personality (Lunde, Frisen, & Hwang, 2006) and internalize negative feedback received from peers more than boys (Storch & Ledley, 2005). Boys appear more likely to view the victimization as a result of a bully's personality (Lunde et al., 2006), or as a normal part of their peer interactions (Storch & Ledley, 2005).

Psychosocial adjustment problems due to peer victimization also affect children from a variety of different racial and ethnic groups. However there are differences across racial or ethnic groups with regards to peer victimization rates and its effects. Within the United States,

similar rates of victimization have been found among Caucasian and Hispanic children (Storch, Nock, Masia-Warner & Barlas, 2003). However, African American children are less likely to be victimized than their Caucasian or Hispanic peers. Unfortunately, among African American children who are victimized, more negative outcomes have been observed including lower self-esteem and increased loneliness (Graham & Juvonen, 1998). Regardless of the type of victimization or how it is viewed, sociopsychological adjustment problems have been associated with victimization in both boys and girls (Crick & Bigbee, 1998), as well as cross-culturally (Nansel et al., 2004).

Potential Effects of Peer Victimization

Peer victimization has been linked with many potential negative effects, both concurrently and prospectively (Storch & Ledley, 2005). Cross-nationally, youth involved in victimization consistently report higher levels of poor adjustment (Nansel et al., 2004), with peer victimization associated with poor social adjustment, increased levels of internalizing and externalizing behaviors, the presence of mental health diagnoses, lower quality of life, and psychosomatic and health symptoms (e.g. Nansel, 2001; Putalvez et al., 2007; Storch & Ledley, 2005).

Peer Victimization and Psychosocial Development

Being bullied has been related to having poorer relationships with classmates, having a lowered ability to make friends, poorer social and emotional adjustment, academic problems, and social anxiety (Hawker & Boulton, 2000; Nansel et al., 2001; Storch & Ledley, 2005). Both individual-level personal variables and peer-relational interpersonal variables contribute to and result from victimization by peers, with the experience of being victimized having negative consequences for children's subsequent personal and social development (Hodges & Perry, 1999). Socially isolated children and children who lack social skills may be likely targets of

victimization (Nansel et al., 2001; Putallaz et al., 2007), and children's peer experiences may serve as a basis upon which children create the social database on which they evaluate themselves and others (Crick & Dodge, 1994). Children with poorer peer experiences are more likely to hold higher levels of critical self-referent attributions and experience more negative thoughts about themselves, which may be associated with engagement in maladaptive social behaviors (Hawker & Boulton, 2000; Prinstein, et al., 2005). A cyclical pattern may be in place, with peer victimization serving as a significant stressor in a child's life. This may then be linked to psychosocial difficulties that often prevent a child from developing appropriate levels of social and coping skills (Storch & Ledley, 2005). This may further increase a child's vulnerability to the effects of this victimization (Storch & Ledley, 2005).

Peer Victimization and Internalizing Behaviors

Peer victimization has also been associated with both an increase in, and the presence of, internalizing behaviors in children. Whether victimization precedes or follows these internalizing behaviors is still unclear, although it is likely that there is a bidirectional relationship between the two. Victims are often described as quiet, cautious, and sensitive, and may respond to victimization with withdrawal (Olweus, 1994). Psychosocial effects such as increased anxiety, depression, and loneliness, as well as decreased self worth are associated with increased peer victimization (Bond et al, 2001; Gini, 2007; Nansel et al., 2001; Prinstien, Cheah & Guyer, 2005; Putallaz et al., 2007; Storch & Ledley, 2005). Similar effects of victimization are typically found in boys and girls; however some studies have found victimization to be predictive of internalizing symptoms such as anxiety and depression only in girls (Bond et al., 2001). However methodological considerations may have impacted these results. For example, the Bond et al. study (2001) utilized four domains to examine victimization, with three of the

four domains reflecting covert (relational) victimization which is typically more common in females.

Bullying may lead to this poor emotional adjustment by negatively shaping the self-concept of victimized children (Nansel et al., 2004), leading them to make negative evaluations of themselves as worthless or inadequate (Olweus, 1994). Concurrent high levels of depressive symptoms and higher peer victimization are associated with higher levels of these negative self-evaluations (Prinstein et al., 2005). Longitudinal analyses have seen these higher levels of depression and lower levels of self esteem to hold into adulthood in people who were victimized as children (Olweus, 1994).

Peer Victimization and Externalizing Behaviors

Increased externalizing behaviors (such as increased conduct problems and hyperactivity) are also linked to increased rates of victimization (Bond et al, 2001; Gini, 2007; Nansel et al., 2001; Putallaz et al., 2007; Storch & Ledley, 2005). An increase in these behavioral problems among victimized children has specifically been observed as problematic in school settings, where bullying often occurs (Gini, 2007). Similar to internalizing problems, these behaviors are observed both as a result of victimization, as well as preceding bullying experiences.

Externalizing problems may be socially inappropriate, disruptive, or aggressive, and as such they may unintentionally provoke bullies and invite victimization (Coie & Dodge, 1988). Children who present with externalizing behaviors may have difficulties handling confrontational situations, thus these situations may escalate and lead to the child being victimized (Champion, Vernberg, & Shipman, 2003). Conversely, externalizing conditions such as attention problems, aggression, and delinquency have been observed in longitudinal studies examining the long term effects of victimization on children's adjustment (Hanish & Guerra, 2002).

Peer Victimization and Mental Health

Given the high number of internalizing and externalizing behaviors associated with victimization, it can be expected that children who are frequently victimized will have higher rates of psychiatric diagnoses. Few studies however have examined actual rates of medically diagnosed psychological disorders in victimized children, with the majority of studies only examining symptoms associated with such diagnoses. One study which examined boys from childhood to early adulthood, observed that multi-informant sources reporting victimization predicted the presence of a medically diagnosed psychiatric disorder at follow-up (Ronning, Sourander, Kumpaulainen, Tamminen, Niemela, Moilanen, et al., 2008). This study however found that the relationship no longer held when adjusting for the presence of psychiatric symptoms at the initial time point (Ronning et al., 2008). Additional methodological weaknesses in the aforementioned study included a one-item measure of the presence of victimization. Another study examined adults who met DSM-IV criteria for depression, using a retrospective recall of childhood victimization. Here, over 25% of the participants reported exposure to bullying as children, with these participants reporting comorbid anxiety symptoms which were uniquely predicted by this victimization (Gladstone, Parker, Gordon, & Malhi, 2006). Unfortunately the retrospective and cross-sectional nature of this study inhibits our ability to make causal inferences from this data.

Peer Victimization and Quality of Life

An individual's personal perception of their overall satisfaction with life and well-being is reflected in their quality of life (Wilkins-Shurmer et al., 2002). Quality of life has many dimensions including areas such as emotional, social, scholastic, and physical well-being (Hommel, Davis, & Baldassano, 2008). Quality of life as a concept includes standards of living, and community and family life (Rabbett, Elbadri, Thwaites, Northover, et al., 1996). While peer

victimization is an important variable related to quality of life in children, having a negative impact on psychosocial well-being (Wilkins-Shurmer, O'Callaghan, Najman, Bor, Williams, & Anderson, 2003), very little research has been done looking specifically at the relationship between these variables. One study found that lower ratings of psychosocial quality of life were strongly associated with an increased frequency of bullying (Wilkins-Shurmer et al., 2002). This relationship was observed using both child self-report and parent-report of the child's quality of life (Wilkins-Shurmer et al., 2002). Additionally, research suggests that negative effects of peer victimization are seen into adulthood (Nansel, et al., 2001), including long term negative effects on quality of life (Ronning et al., 2008). Further recognition of bullying, and the development of initiatives to prevent and intervene in bullying behaviors, are thought to have the potential to enhance children's quality of life (Wilkins-Shurmer et al., 2002).

Psychosomatic and Health Effects of Victimization

Not surprisingly, it has been suggested that peer victimization contributes to unexplained psychosomatic symptoms (Lyznicki et al., 2004), and repeated common health ailments (Wolke et al., 2001). An increase in common psychosomatic and health symptoms including headaches, stomachaches, sore throats, colds, and sleep difficulties are associated with higher rates of peer victimization (Due et al., 2007; Fekkes et al., 2006; Gini, 2007; Wolke et al., 2001), with these relationships holding in longitudinal studies (Due et al., 2007). In fact, it is recommended that an assessment of victimization should occur during physician visits (Lyznicki, Mccaffree, & Robinowitz, 2004; Storch & Ledley, 2005; Van Cleave & Davis, 2006) due to the extent which bullying may contribute to health symptoms (Fekkes et al., 2006). A causal relationship has been previously established, with the development of new psychosomatic symptoms observed in children who were previously victimized (Fekkes et al., 2006). These relationships are also demonstrated across numerous countries (Nansel et al., 2004).

Victims of bullying are also prone to use medicine to treat pain and psychological problems more frequently than those who are not victimized, regardless of symptom level (Due et al., 2007). In the Due et al., study, bullied boys used medicine to treat symptoms more frequently than girls, although both genders had higher rates of medicine use correlated with higher rates of victimization (2007). Some medicines (such as headache and stomachache medicines) had a 40-70% increased odds of use among victimized children (Due et al., 2007). This increased medication use can be dangerous, and detrimental to these children's overall health, further highlighting the negative impacts of peer victimization.

Gini and colleagues have hypothesized that victimization leads to a higher number of health complaints due to the high level of stress associated with being bullied, and the consistency across time of these experiences (2007). It has been debated whether these relationships are specific to overt victimization or covert (relational) victimization, as opposed to victimization overall, however few studies examining health symptoms and victimization have examined these domains separately. One such study found that overt victimization and combined overt and covert victimization, but not relational victimization alone, were related to increases in psychosomatic symptoms (Wolke et al., 2001).

Victimization is also related to an increased risk of concurrent problems in children with specific health conditions (Greco, Freeman, & Dufton, 2007). This may be due to the presence of observable symptoms or adherence behaviors associated with some health conditions and their treatment regimens, which are often targeted in bullying behaviors (Janicke, et al., 2008; Storch & Ledley, 2005). These symptoms may be psychosomatic, or invented, as children who are victimized at school may actually fake illnesses if they are school avoidant in order to stay home during school days (Fekkes et al., 2006; Wolke et al., 2001).

Children's Health Care Use

According to the National Coalition on Health Care (NCHC), health care costs are rising at a rapid rate, with expenditures expected to raise a total of 6.9% in 2008, with this rate of increase continuing over the next decade (2009). Understanding children's health care use is important because patterns of health care use are established early in life, so that ineffective use of services as a child may negatively affect health through the life span (Janicke & Finney, 2000). Given the continued increase in health care costs, it is important to further the understanding of what predicts health care use in order to potentially prevent ineffective use of services and higher costs.

Children's health care utilization rates and associated costs are impacted by a myriad of child and family variables. Unfortunately, an overview of the literature in this area suggests that, at best, researchers have only identified variables that account for roughly 30-40% of the variance in children's health care use (Janicke & Finney, 2000). This suggests that there are still many variables which impact health care use and costs in children which are not currently understood. Not surprisingly, child health status, as well as parent perception of child health status are important variables, accounting for about 16% of the total variance in health care use (Janicke & Finney, 2000; Wolfe, 1980). Parent and family variables, as well as demographic variables, are also important predictors of children's health care use and expenditures (Wolfe, 1980; Simpson, Owens, Zodet, Chevarley, Dougherty, Elixhauser, & McCormick, 2005). Younger children, Caucasian children, and Hispanic children, for example, tend to utilize more services (with highest services rates in descending order being seen in Caucasians, Hispanics, and African Americans) (Horwitz, Morgenstern, Berkman, 1985; McCormick, Kass, Elixhauser, Thompson, and Simpson, 2000; Simpson et al., 2005). Socioeconomic status is also an important predictor of health care use. Middle to high income children tend to use office-based

services more frequently than lower income children (76.5% vs. 63.7%), who use more acute based care, such as that provided through emergency departments (Simpson et al., 2005). Health care costs for office visits typically follow a similar pattern to utilization rates, with highest costs being seen among Caucasian children, followed by Hispanic and then African American children (Simpson, et al., 2005).

Child mental health status is an additional important predictor of total health care use. Mental health conditions are one of the most prevalent reasons for children's hospital admissions (Simpson et al., 2005). Disruptive behavior disorders such as ADHD, conduct disorders, and oppositional defiant disorder are among the primary reasons for hospitalization in children from lower income communities, while mood disorders such as depressive and bipolar disorders are more common reasons in median income communities (Simpson et al., 2005). In addition to the increased rates of children with mental health conditions who are hospitalized, many children present to their primary care physicians with these behavioral, emotional, or peer relationship concerns (Janicke & Finney, 2000). Total behavior problems, and externalizing and internalizing symptoms and behaviors are linked to higher rates of health care utilization (Lavigne, Binnes, Arend, Rosenbaum, et al., 1998; Riley, Finney, Mellits, Starfield, et al., 1993; Woodward, Boyle, Offord, Cadman, et al, 1988). Research has indicated that different findings exist however when the variable for child mental health status is manipulated. For example, parent reports of the number and intensity of behavioral and emotion problems (such as those on the Child Behavior Checklist) are often more predictive of health service use than the presence of a Diagnostic and Statistical Manual (DSM) based mental health diagnosis (Lavigne et al., 1998).

There are however methodological weaknesses in some previous literature examining health care use. Much of past research focused primarily on parental report of health care visits to analyze factors impacting health service utilization. Large administrative databases such as those kept by Medicaid, Medicare, and state registries and claims data provide more accurate information when looking to examine health care utilization and its associated costs, and are considered optimal in studies examining health care utilization and expenditures (Diehr, Yanez, Ash, Hornbrook, & Lin, 1999).

Current Study

Given the continued rapid rises in health care costs, it is increasingly important to develop a greater understanding of the factors that impact health care costs. Peer victimization has been linked to a number of negative psychosocial and health outcomes. Given these associations, it is reasonable to expect that higher rates of peer victimization may be associated with higher health care use and expenditures. Unfortunately, to our knowledge there is no published data examining the association between peer victimization and expenditures for pediatric health care services. Therefore the first aim of the current study is to determine if peer victimization is related to health care costs. In addition, we want to determine if psychosocial functioning serves as a mediator between the experience of peer victimization and health care costs. Since psychosocial functioning can be measured in numerous ways, we will examine three different measures of psychosocial functioning as mediators in this relationship: (a) total behavior problems, (b) quality of life, and (c) presence of a mental health diagnosis. It is hypothesized that higher rates of peer victimization will be associated with higher health care costs (specifically acute care costs). Further, it is hypothesized that each domain of psychosocial functioning (total behavior problems, quality of life, presence of a mental health diagnosis) will act as a mediator in the relationship between peer victimization and health care costs such that;

1) higher rates of peer victimization will be associated with more total behavior problems, and higher health care costs, 2) higher rates of peer victimization will be associated with lower quality of life, and higher health care costs, and 3) higher rates of peer victimization will be associated with the presence of a mental health diagnosis, and higher health care costs.

CHAPTER 2 METHODS

Participants were 213 children, ages 7-15 years, and their parent or legal guardian attending a scheduled appointment at a participating primary care clinic (the Department of Pediatrics Primary Care Clinics at Shands Hospital and Haile Plantation).

Procedures

This study was part of a larger study which was approved by the governing Institutional Review Board examining the impact of weight status on health care costs among children enrolled in Florida Medicaid. Participants who met research criteria were approached by a member of the research team while waiting in private patient rooms during their physician visits. They were provided with an introduction to the study, and parental consent and child assent were obtained prior to data collection. Once consent and assent were obtained, the child-guardian dyads were given individual questionnaire packets to complete independently. These packets were administered in the private patient rooms, and took approximately 30 minutes to complete. The participants were encouraged to complete these packets independently; however a research assistant remained available to answer any questions. Upon completion, each participating child-parent dyad received a twenty dollar Wal-mart gift card as compensation.

Participant Requirements

All participants were required to meet the following criteria to be eligible for study participation: (1) currently enrolled in Florida Medicaid, (2) between the ages of 7 and 15 years old, (3) accompanied by a parent/legal guardian, (4) attending a scheduled appointment at a participating primary care clinic, and (5) able to speak and understand English. Children diagnosed as mentally retarded or as having a psychotic disorder were excluded from participation in the study.

Measures

The following measures were completed as part of a larger packet of questionnaires.

Child measures

Pediatric Quality of Life Inventory (PedsQL- Varni, Seid, Kurtin, 2001). The PedsQL measures children's health related quality of life. It consists of 23 items, and can be used to measure quality of life in healthy children, and in those with acute or chronic conditions. All items are rated on a 5 point Likert scale, anchored from "0-Never a problem" to "4-Almost always a problem". Items make up four individual subscales, accounting for physical, emotional, social, and school related areas of quality of life. These scales combine to create a measure of overall quality of life, which will be utilized in primary analyses. This measure has been reported to have excellent internal consistency, clinical validity, and factor-analytic support for each of its scales (Varni, et al., 2001).

Social Experience Questionnaire (SEQ- Crick & Grotpeter, 1996). This is a 14-item measure modified from the original 15-item Social Experience Questionnaire. The 14-item measure used in this study consists of two subscales, total peer victimization (9 items) and the receipt of prosocial behaviors (5 items). The total peer victimization score will be utilized in the primary analyses for this study. The items are rated on a 5 point Likert scale, ranging from "0-Always" to "5-Never". It includes questions such as "How often do you get pushed around or shoved". Good psychometric properties have been reported for this measure (Crick & Grotpeter, 1996). Internal consistency for the total peer victimization scale score (used in primary analyses) in the current sample was good ($\alpha = 0.85$).

Adult measures

Child Behavior Checklist (CBCL- Achenbach, 1991). This is a 118 item measure which assesses internalizing and externalizing behavior problems, as well as allowing for the

calculation of a total behavior problems score in children. Items are rated on a 3 point Likert scale. The anchors range from “0-Not true” to “2-Often true”. It includes questions to assess internalizing behaviors such as anxiety, somatic complaints, and depression, as well as externalizing behaviors such as aggression, hyperactivity, and noncompliance. Extensive reliability and validity data have been reported on this measure, including excellent internal consistency and 15-day test-retest reliability, a stable factor structure, and positive relations with other measures of childhood behavior (Achenbach, 1991; Achenback & Rescorla 2001; Bingham, Loukas, Fitzgerald, & Zucker, 2003). The current study will utilize the total behavior problems score.

Demographic Questionnaire. This questionnaire gathers family background information including child age, gender, year in school, and race; marital status, and highest education completed by parents or guardians; child use of medication for psychiatric conditions; diagnoses of child psychiatric or obesity-related health conditions; parental general health status, frequency of parental physician and ER visits over the past three months; and parent perception of their child’s weight.

Data from Medicaid database.

Health care expenditures and ICD-9 diagnosis were extracted from the Medicaid database for each Medicaid claims for the year prior to the study questionnaire completion date for each participant. This data was extracted based on each child’s individual Medicaid identification number.

Mental health diagnosis. Presence of a mental health diagnosis was determined by ICD-9 codes associated with psychiatric conditions. Each patient was flagged as either having or not having a diagnosed mental health condition, creating a yes/no dichotomous variable.

Health care expenditures. Medicaid expenditures were calculated using the amount Medicaid paid to health care providers for their services. Expenditures were extracted and identified based on Medicaid procedure codes. Costs were accumulated for outpatient well-check and acute care visits. Well-check expenditures are those costs associated with visits that are typically required (e.g. physicals and immunizations). During these visits, physicians assess children's physical and emotional development, give guidance and immunizations, and complete any needed tests (Larson & McCarthy, 2008). Acute care expenditures are associated with visits which are primarily patient initiated, involving brief treatments of more severe symptoms. The primary intent during acute care visits is to relieve symptoms or reduce their severity, to protect against exacerbation and complications of illnesses or injuries, as well as to perform diagnostic or therapeutic procedures (Or, 2000). Total costs associated with acute visits were examined as the chief variable for health care utilization to examine these primarily patient initiated visits.

Statistical Analyses

Data were analyzed using SPSS software (Versions 15.0 and 16.0). First, bivariate correlation analyses, one-way ANOVAs and an independent samples t-test were completed to assess for associations between demographic variables (child: gender, age, race/ethnicity, weight status; parent: relationship to child, education level, marital status) and acute health care expenditures, the primary outcome variable. Next, hypothesis one was tested using a regression analysis to determine the relationship between peer victimization and acute care costs (a hierarchical analysis would be used if any demographic variables were found to be significantly associated with health care costs, with those variables being controlled for in block one of the analyses; a linear analysis would be used if no demographic variables needed to be controlled). Further analyses were employed to delineate this relationship via three mediation models. Specifically, consistent with mediator analysis instructions in Baron and Kenny (1986), a series

of regression analyses were performed. For each model, three hierarchical regressions were run. In order to determine if a mediating relationship was present, three steps were followed 1) the predictor variable (peer victimization) must be related to the potential mediator (parent report of total behaviors, child report of quality of life, or presence of a mental health diagnosis), 2) the predictor variable must be related to the outcome variable (health care costs), and 3) when the predictor variable and the potential mediator were entered into a multiple regression together onto the outcome variable, the mediator must be associated with the outcome variable and the relationship between the predictor variable and the outcome variable must be smaller than originally found in step 2. Full mediation occurred if there was no relationship between the predictor variable and the outcome variable after including the mediating variable. Partial mediation occurred if the relationship between the predictor variable and the outcome variable only partly reduced. These regressions were run as a series of either linear or logistic regressions depending on the mediator (linear regressions: total behavior problems and quality of life; logistic regressions: presence of a mental health diagnosis). As the final step, a Sobel test was performed utilizing the unstandardized regression coefficients and their standard errors for: a) the association between the predictor variable and the mediator, and b) between the mediator and the dependent variable in the presence of the predictor variable, based on a series of linear regressions. This determined if the effect of the mediator on this relationship was statistically significant (Baron & Kenny, 1986; Holmbeck 2002). These steps were tested for each of the proposed mediation models (Figure 2-1). While the third mediator, presence of a mental health diagnosis was tested using a series of logistic regressions, a series of linear regressions were also run in order to gain the necessary statistical data to complete the Sobel test.

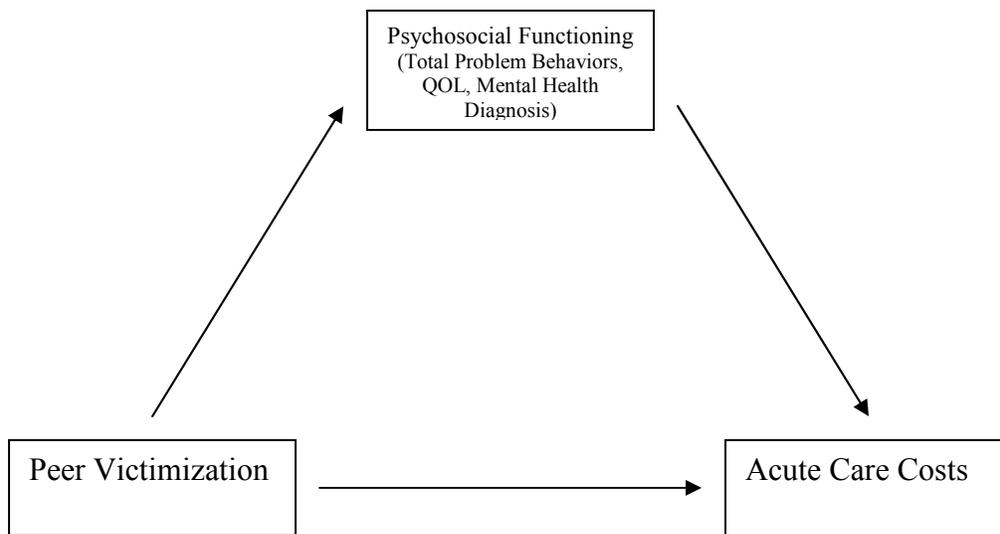


Figure 2-1. Representation of the mediation model: Psychosocial functioning mediating the relationship between peer victimization and acute care costs.

CHAPTER 3 RESULTS

Demographics

The participating children were between 7 and 15 years old (mean age = 11.13; SD = 2.47). 51.6% of the child participants were male. There was a higher percentage of African Americans (61.5%) relative to Caucasian (25.4%), Hispanic (6.6%), and other (6.5%) child participants. Participating legal guardians were predominantly mothers (76.5%), with grandparents (11.2%), fathers (4.7%), and other guardians (7.5%) comprising a smaller percentage of the participating sample. The sample was primarily of lower socioeconomic status, with relatively low parent education levels (47.8% high school graduates or below). See Table 3-1 for further demographic information.

Effects of Demographics on Health Care Costs

Bivariate correlation analyses examining the association between demographic variables (child age and weight status) and acute health care costs found that none of the demographic variables were significantly correlated with acute care costs. One-way ANOVAs found that acute care expenditures did not differ by child race/ethnicity, or parent: relationship to child, education level and marital status. In addition, an independent samples t-test found that acute care costs did not differ by gender. Therefore these demographic variables were not included as control variables in further analyses.

Peer Victimization and Health Care Costs

The relationship between peer victimization and acute health care costs was examined using a linear regression. Peer victimization was significantly associated with acute health care costs (dependent variable), ($F(1, 211) = 5.120 p < 0.05, \beta=0.154$), such that higher levels of peer

victimization were associated with higher acute care expenditures. This relationship accounted for 2.4% of the variance in acute care expenditures.

Psychosocial Variables as Mediators in the Relationship Between Acute Care Costs and Peer Victimization

The mediating role of psychosocial functioning in the relationship between peer victimization and acute health care costs was assessed using three measures of psychosocial functioning: parent report of child total behavior problems, child report of quality of life, and medical diagnosis of mental health conditions as noted by ICD-9 codes.

Total behavior problems as a mediator in the relationship between acute care expenditures and peer victimization

The steps outlined by Baron and Kenny (1986) were used to test the hypothesized mediational relationship. In step one peer victimization (independent variable) was found to be significantly correlated with parent report of total behavior problems (mediator), ($F(1, 210) = 20.486, p < 0.000$, see Table 3-2). In step two, peer victimization was significantly related to acute care costs (dependent variable), ($F(2, 211) = 5.12, p < 0.025$, Table 2), accounting for 2.4% of the variance. In step 3, when both peer victimization (independent variable) and parent report of total behaviors (mediator) were regressed upon acute care costs (dependent variable), the parent report of total behaviors was significantly associated with health care costs. In addition, the inclusion of the mediator reduced the effects of peer victimization on acute care costs to non-significant levels. The total model was significant ($F(2, 209) = 9.495, (R^2 = .083) \Delta R^2 = .059, p < 0.000$). A Sobel test confirmed that the effect of the mediator on this relationship was significant $T = 2.799, p < 0.05$. The addition of the mediator increased the percentage of variance explained from 2.4% to 8.3% (see Figure 3-1).

Quality of life as a mediator in the relationship between acute care expenditures and peer victimization

The steps outlined by Baron and Kenny (1986) were again used to test the hypothesized mediational relationship. In step one peer victimization (independent variable) was found to be associated with child report of quality of life (mediator), ($F(1, 211) = 94.573, p < 0.000$, see Table 3-3). Step two was the same as in the previous analyses, with peer victimization significantly related to acute care costs (dependent variable), accounting for 2.4% of the variance. In step 3, when both peer victimization (independent variable) and child report of quality of life (mediator) were regressed upon acute care costs (dependent variable), the child report of quality of life was significantly associated with acute care costs. In addition, the inclusion of the mediator reduced the effects of peer victimization on acute care costs to non-significant levels. The total model was significant ($F(2,210) = 4.836, (R^2 = .044) \Delta R^2 = .02, p < 0.05$). A Sobel test confirmed that the effect of the mediator on this relationship was significant $T = 2.075, p < 0.05$. The addition of the mediator increased the percentage of variance explained from 2.4% to 4.4% (see Figure 3-2).

Mental health diagnosis as a mediator in the relationship between acute care expenditures and peer victimization

In order to examine presence of a mental health condition (a dichotomous variable) as a mediator in the relationship between acute care costs and peer victimization, the same steps as outlined by Baron and Kenny (1986) were followed with a slight modification. As noted by MacKinnon and Dwyer (1993), this mediational analysis was completed using logistic as opposed to linear regressions. In step one peer victimization (independent variable) was found to be associated with presence of a mental health diagnosis (mediator), accounting for 3% of the variance ($Wald \chi^2 (1) = 6.489, p < 0.05$ see Table 3-4). Step two was the same as in the previous analyses, with peer victimization significantly related to health care costs (dependent variable),

accounting for 2.4% of the variance. In step 3, when both peer victimization (independent variable) and presence of a mental health condition (mediator) were regressed upon health care costs (dependent variable), the presence of a mental health condition was significantly associated with health care costs. In addition, the inclusion of the mediator reduced the effects of peer victimization on health care costs to non-significant levels. The total model was significant ($F(2, 210) = 18.37, (R^2 = .149) \Delta R^2 = 0.125, p < 0.05$). A Sobel test confirmed that the effect of the mediator on this relationship was significant $T = 5.671, p < 0.000$. The addition of the mediator increased the percentage of variance explained from 2.4% to 14.9% (see Figure 3-3).

Follow-up Analyses: Externalizing and Internalizing Behavior Problems.

To gain further insight into the mediational impact of behavioral and emotional problems on the relationship between peer victimization and acute care expenditures, parent report of child total behavior problems was broken down into two subscales, internalizing behaviors and externalizing behaviors.

The steps outlined by Baron and Kenny (1986), were first used to examine internalizing behavior problems as a mediator. In step one peer victimization (independent variable) was found to be associated with parent report of child internalizing behaviors (mediator), ($F(1, 210) = 12.502, p < 0.05$, see Table 3-5). Step two was the same as in the previous analyses, with peer victimization significantly related to acute care costs (dependent variable). In step 3, when both peer victimization (independent variable) and parent report of internalizing behaviors (mediator) were regressed upon acute care costs (dependent variable), the child internalizing behaviors were significantly associated with acute care costs. In addition, the inclusion of the mediator reduced the effects of peer victimization on acute care costs to non-significant levels. The total model was significant ($F(2, 209) = 8.677, (R^2 = .077) \Delta R^2 = .052, p < 0.000$). A Sobel test confirmed

that the effect of the mediator on this relationship was significant $T = 2.395, p < 0.05$ (see Figure 3-4).

The steps outlined by Baron and Kenny (1986) were then used to determine if externalizing behavior problems served as a mediator. In step one peer victimization (independent variable) was found to be associated with parent report of child externalizing behaviors (mediator), ($F(1, 210) = 21.447, p < 0.000$, see Table 3-6). Step two was the same as in the previous analyses, with peer victimization significantly related to acute care costs (dependent variable). In step 3, when both peer victimization (independent variable) and parent report of externalizing behaviors (mediator) were regressed upon acute care costs (dependent variable), the child externalizing behaviors were significantly associated with acute care costs. In addition, the inclusion of the mediator reduced the effects of peer victimization on acute care costs to non-significant levels. The total model was significant ($F(1,209) = 8.070, (R^2 = .072) \Delta R^2 = .047, p < 0.000$). A Sobel test confirmed that the effect of the mediator on this relationship was significant $T = 2.53, p < 0.05$ (see Figure 3-5).

Follow-up Analyses: Physical, Emotional, Social, and School Quality of Life

To garner additional information of the mediational impact of quality of life on the relationship between peer victimization and acute care expenditures, child report of quality of life was broken down into four subscales, physical, emotional, social, and school quality of life.

The steps outlined by Baron and Kenny (1986), were then used to examine each domain of quality of life as a mediator between peer victimization and acute care costs. Only social quality of life was found to act as a mediator in this relationship. When examining social quality of life, in step one, peer victimization (independent variable) was found to be strongly associated with child report of social quality of life (mediator), ($F(1, 211) = 101.767, p < 0.000$, Table 3-7). Step two was the same as in the previous analyses, with peer victimization significantly related

to health care costs (dependent variable). In step 3, when both peer victimization (independent variable) and child report of social quality of life (mediator) were regressed upon health care costs (dependent variable), social quality of life was significantly associated with health care costs. In addition, the inclusion of the mediator reduced the effects of peer victimization on health care costs to non-significant levels. The total model was significant ($F(1,210) = 4.968$, $(R^2 = .045)$ $\Delta R^2 = .021$, $p < 0.05$). A Sobel test confirmed that the effect of the mediator on this relationship was significant $T = 2.12$, $p < 0.05$ (see Figure 3-6).

Follow-up Analyses: Well-Check Visits

In order to further explore the relationship between peer victimization and health care costs, costs associated with well-check visits were also examined. Bivariate correlation analyses examining the association between well-check expenditures and victimization found that these costs were not significantly correlated with peer victimization. Thus, there was no need to further examine possible mediational analyses.

Table 3-1. Participant demographic data

	N	M	SD	Range	%
Child					
Age	213	11.13	2.465	8	
Gender					
Male	110				51.6
Female	113				48.4
Race/Ethnicity					
Caucasian	54				25.4
African American	131				61.6
Hispanic	14				6.6
Other	14				6.5
Weight Status					
BMI z-score	213	1	1	6	
Not Overweight	100				46.9
Overweight	67				31.5
Obese	46				21.6
Parent					
Relationship to Child					
Mother	163				76.5
Father	10				4.7
Grandparent	24				11.2
Other	16				7.5
Education Level					
Middle School	5				2.4
Some High School	34				16.4
High School Graduate	60				29
Some College	81				39.1
Graduated College	23				11.1
Post-Graduate School	4				1.9
Marital Status					
Married	89				42.6
Single	120				57.4

N = Number of Participants; M = Mean; SD = Standard Deviation

Table 3-2. Hierarchical regression analysis summary for total child behaviors mediating the relationship between peer victimization and acute care costs

Independent Variable	Dependent Variable	B	SEB	β	R ²	F
Equation 1						
Peer Victimization	Total Behaviors	0.026	0.006	0.298**	0.089	20.486**
Equation 2						
Peer Victimization	Acute Care Costs	0.115	0.051	0.154*	0.024	5.12*
Equation 3						
Peer Victimization	Acute Care Costs	0.06	0.052	0.8	0.083	9.495**
Total Behaviors		2.185	0.596	0.254**		

* $p < 0.05$, ** $p < 0.001$

B = Unstandardized Beta; β = Standardized Beta

Table 3-3. Hierarchical regression analysis summary for child quality of life mediating the relationship between peer victimization and acute care costs

Independent Variable	Dependent Variable	B	SEB	β	R ²	F
Equation 1						
Peer Victimization	Quality of Life	-0.043	0.004	-0.556**	0.309	94.573**
Equation 2						
Peer Victimization	Acute Care Costs	0.115	0.051	0.154*	0.024	5.12*
Equation 3						
Peer Victimization	Acute Care Costs	0.044	0.061	0.058	0.044	4.836*
Quality of Life		-1.656	0.783	-.172*		

* $p < 0.05$, ** $p < 0.001$

B = Unstandardized Beta; β = Standardized Beta

Table 3-4. Hierarchical regression analysis summary for mental health diagnosis mediating the relationship between peer victimization and acute care costs

Independent Variable	Dependent Variable	B	SEB	Wald χ^2	R ²	F
Equation 1					0.03	
Peer Victimization	Mental Health Diagnosis	0.002	0.001	6.489*		
Equation 2					0.024	5.12*
Peer Victimization	Acute Care Costs	0.115	0.051	0.154*		
Equation 3					0.149	18.370**
Peer Victimization	Acute Care Costs	0.067	0.048	0.09		
Mental Health Diagnosis		110.04	19.798	.360**		

* $p < 0.05$, ** $p < 0.001$

B = Unstandardized Beta; β = Standardized Beta

Table 3-5. Hierarchical regression analysis summary for internalizing behaviors mediating the relationship between peer victimization and acute care costs

Independent Variable	Dependent Variable	B	SEB	β	R ²	F
Equation 1					0.056	12.502**
Peer Victimization	Internalizing Behaviors	0.01	0.003	.237**		
Equation 2					0.024	5.12*
Peer Victimization	Acute Care Costs	0.115	0.051	0.154*		
Equation 3					0.077	8.677**
Peer Victimization	Acute Care Costs	0.075	0.051	0.1		
Internalizing Behaviors		4.28	1.243	.236**		

* $p < 0.05$, ** $p < 0.001$

B = Unstandardized Beta; β = Standardized Beta

Table 3-6. Hierarchical regression analysis summary for externalizing behaviors mediating the relationship between peer victimization and acute care costs

Independent Variable	Dependent Variable	B	SEB	β	R ²	F
Equation 1					0.093	21.447**
Peer Victimization	Externalizing Behaviors	0.016	0.004	.304**		
Equation 2					0.024	5.12*
Peer Victimization	Acute Care Costs	0.115	0.051	0.154*		
Equation 3					0.072	8.07**
Peer Victimization	Acute Care Costs	0.065	0.052	0.086		
Externalizing Behaviors		3.211	0.983	.228**		

* $p < 0.05$, ** $p < 0.001$

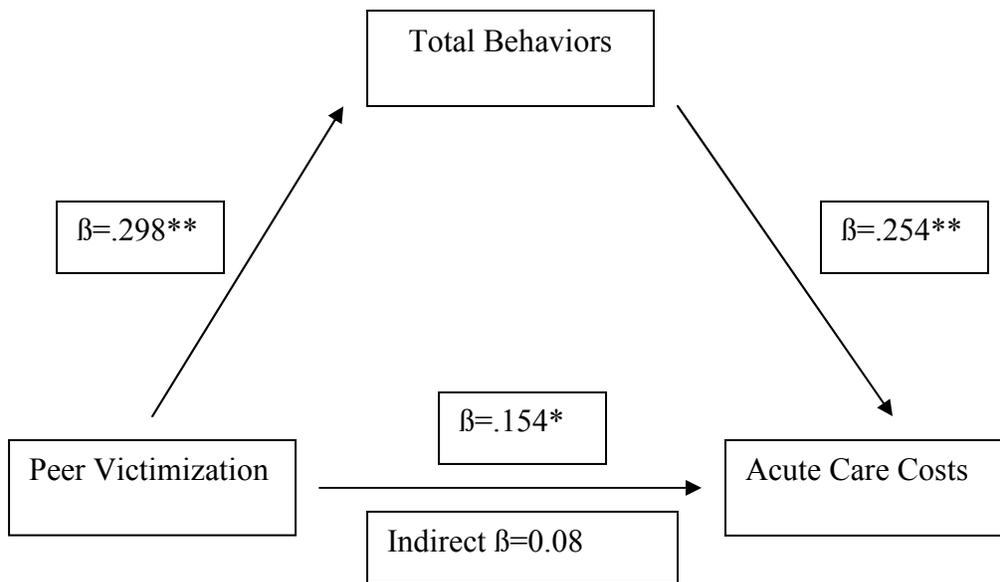
B = Unstandardized Beta; β = Standardized Beta

Table 3-7. Hierarchical regression analysis summary for social quality of life mediating the relationship between peer victimization and health care costs

Independent Variable	Dependent Variable	B	SEB	β	R ²	F
Equation 1					0.325	101.767**
Peer Victimization	Social Quality of Life	-0.067	0.007	.570**		
Equation 2					0.024	5.12*
Peer Victimization	Acute Care Costs	0.115	0.051	0.154*		
Equation 3					0.045	4.968*
Peer Victimization	Acute Care Costs	0.039	0.062	0.052		
Social Quality of Life		-1.135	0.522	-.178*		

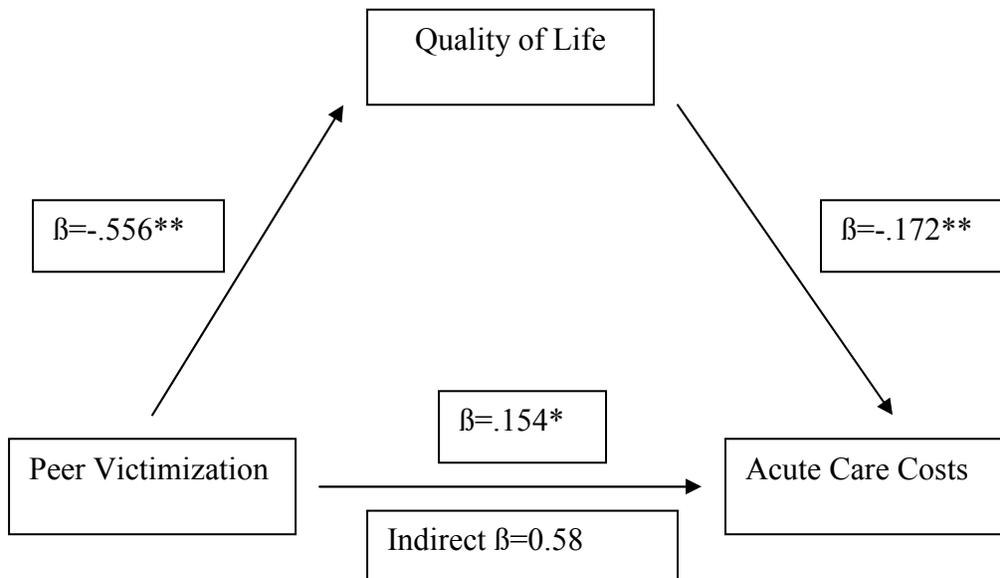
* $p < 0.05$, ** $p < 0.001$

B = Unstandardized Beta; β = Standardized Beta



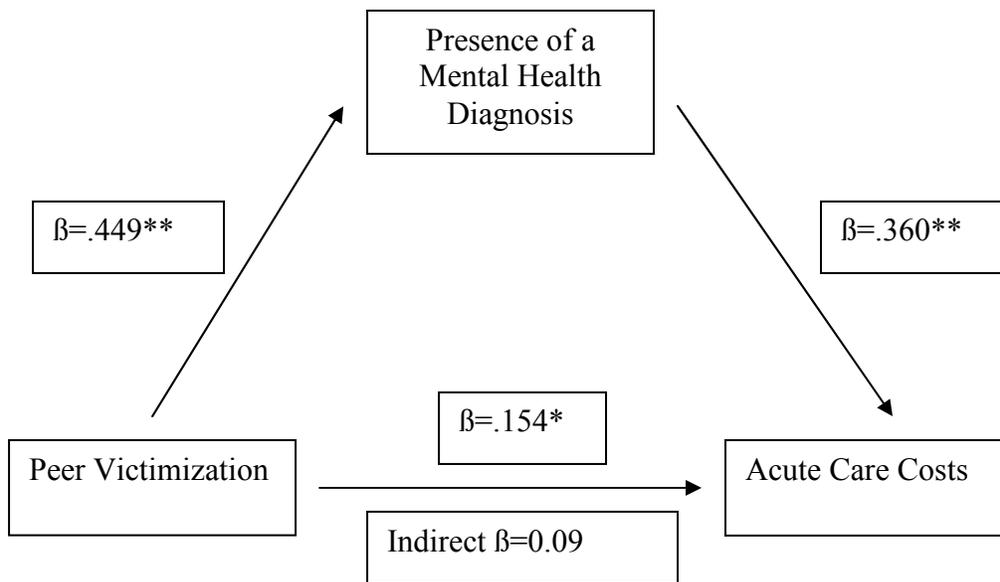
* $p < 0.05$, ** $p < 0.001$

Figure 3-1. Parent report of total mediating the relationship between peer victimization and acute care costs.



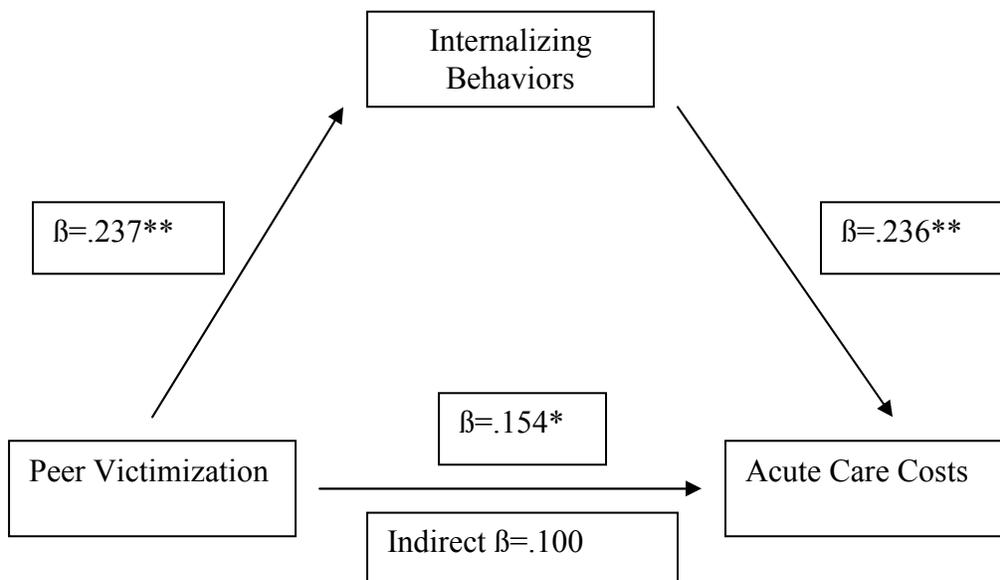
* $p < 0.05$, ** $p < 0.001$

Figure 3-2. Child quality of life mediating the relationship between peer victimization and acute care costs.



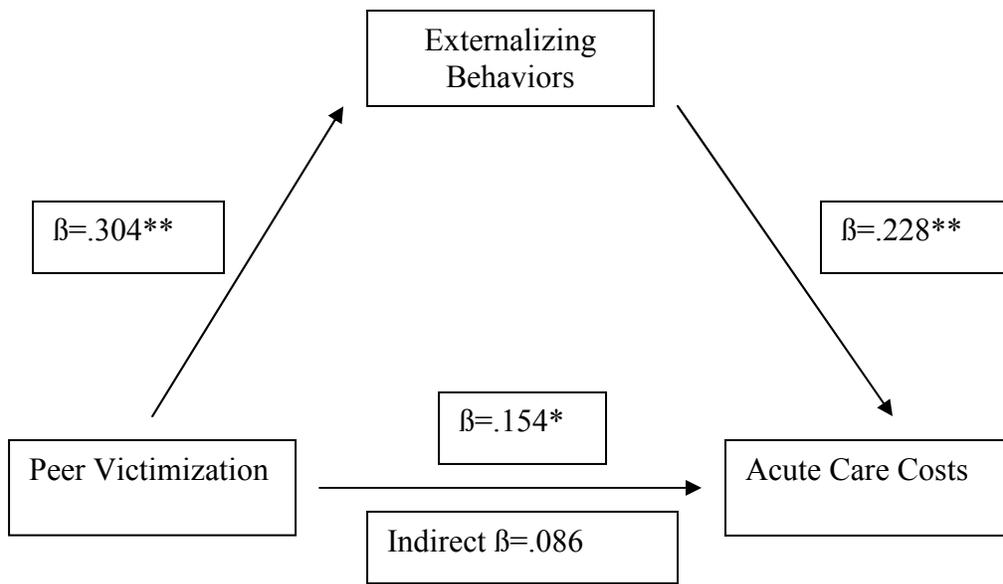
* $p < 0.05$, ** $p < 0.001$

Figure 3-3. Presence of a mental health variable mediating the relationship between peer victimization and acute care costs.



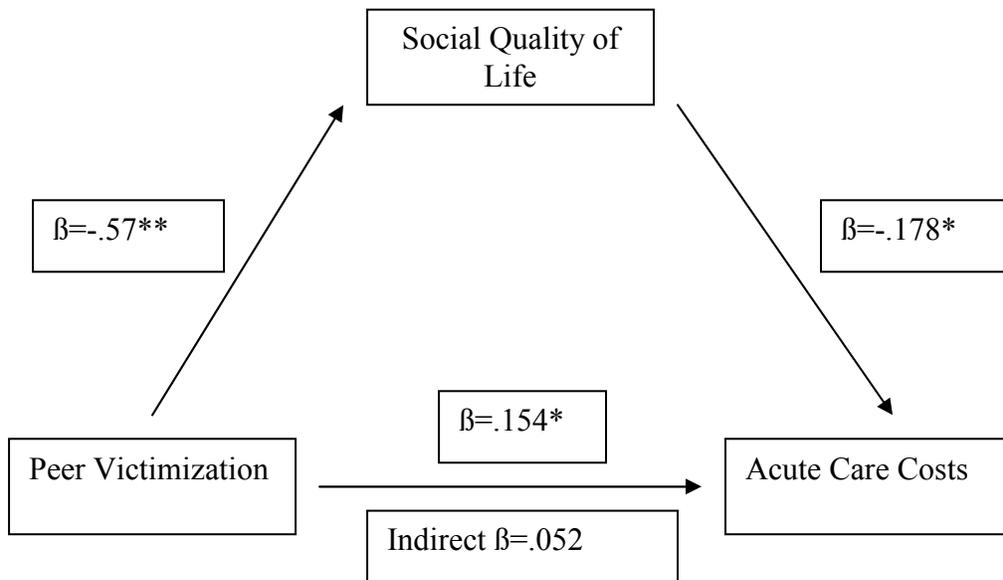
* $p < 0.05$, ** $p < 0.001$

Figure 3-4. Internalizing behaviors mediating the relationship between peer victimization and acute care costs.



* $p < 0.05$, ** $p < 0.001$

Figure 3-5. Externalizing behaviors mediating the relationship between peer victimization and acute care costs.



* $p < 0.05$, ** $p < 0.001$

Figure 3-6. Social quality of life mediating the relationship between peer victimization and acute care costs.

CHAPTER 4 DISCUSSION

The current study is unique in that it is the first known study to examine the impacts of peer victimization on children's health care costs. Peer victimization is linked to a myriad of negative impacts, such as increased levels of internalizing and externalizing behaviors, lower quality of life, poor social adjustment, increased rates of mental health diagnoses, and psychosomatic and health symptoms (e.g. Nansel, 2001; Nansel et al., 2004; Putalvez et al., 2007; Storch & Ledley, 2005). The results of the current study further highlight the potential negative impacts of peer victimization, specifically its association with acute health care costs. Given the continued rise in health care costs, expanding our understanding of factors that are associated with health care expenditures in children is critical.

As expected, peer victimization was significantly associated with acute health care costs in the current sample. As this study was cross sectional in nature, we can not determine directionality and causation between these variables. However, the mediational models tested in this study were designed to delineate potential pathways of effect that can be investigated in future studies and inform future work in this area. As peer victimization has been shown to lead to increased behavioral and emotional difficulties (Nansel et al., 2001; Storch & Ledley, 2005), and such problems are associated with increased health care expenditures in children (Janicke & Finney, 2000), we hypothesized that child psychosocial functioning would mediate the relationship between peer victimization and health care expenditures. Our analyses confirmed our hypotheses in that each of the three measures of psychosocial functioning in this study mediated the relationship between peer victimization and pediatric acute care expenditures.

The addition of psychosocial functioning (across parent, child, and medical record reports) as a mediator in the relationship between peer victimization and acute care costs greatly increased the total variance explained by the model, from 2.4% to as much as 14.9%. As such, further examination of each of these models can help us speculate on potential pathways of effect. It is possible that experiences of victimization may lead to an increase in psychological distress, and/or actual physical injuries from aggressive attacks (such as those associated with overt victimization). Psychological distress can be expressed by children in a number of ways which might in turn impact their health care use. Such distress can lead to somatic complaints that may be real or feigned, anxiety and depression, aggressive behaviors, hyperactivity and acting out, poor social relationships, or school avoidance. Parents may then seek help from their child's primary care doctor for perceived poor health status, psychosocial distress, or other unspecified reasons. Thus, peer victimization may lead to psychological or somatic symptoms, which may then lead to increased health care use, specifically of acute services which are initiated based on short-term or immediate patient needs.

The inclusion of the presence of a mental health condition variable as a mediator represented the highest increase in variance explained in the overall model. A diagnosis of a mental health condition may reflect higher severity of symptoms associated with psychological distress, which in turn may be associated with a more pressing need for intervention. The use of primary care physicians for psychological treatment may be more typical in lower SES populations where access to more optimal treatments may be limited, too expensive, or not covered by insurance. In addition, the increased variance seen with the inclusion of this mediator may reflect the more direct relationship between a diagnosis and the need for health care visits to make and/or treat such diagnoses.

Of the three significant mediating variables used in the current study to measure psychosocial functioning, two were based on self-report measures completed by the parent (CBCL) and child (PedsQL). While initial analyses examined these mediating variables using total scores, both the total behavior problems and quality of life measures incorporate scales which included different domains of psychosocial functioning. Thus, further examination of these significant mediators was conducted to better understand the contribution of psychosocial functioning to the increased variance explained in the model. Understanding if any of the different categories function as a stronger mediator between peer victimization and expenditures could help inform future research and treatment planning. First, the total behavior problems score was broken down into internalizing and externalizing subscales. Internalizing and externalizing behaviors represent two fairly distinct categories of behavioral and emotional functioning. Internalizing difficulties are typically reflected in increased anxiety, depression, loneliness, and withdrawal, while externalizing problems typically include increased conduct problems, hyperactivity, and oppositional and aggressive behaviors (e.g. Bond et al., 2001; Gini, 2007). It is possible that these different categories of psychosocial functioning may have different relationships with peer victimization and health care use. For example, some research suggests that victims of peer victimization are more likely to experience increased levels of anxiety and depression, as opposed to more oppositional or aggressive behaviors, while other research reflects the opposite trend (Bond et al., 2001; Gini 2007, Putallaz et al., 2007). In addition, internalizing and externalizing behaviors can have different impacts on health care utilization. Internalizing behaviors can be misinterpreted or may present as somatic complaints, which can lead to misdiagnoses, less than optimal treatment, and ultimately increased expenditures (Janicke & Finney, 2000). On the other hand, children's internalizing symptoms

may not be perceived as burdensome to parents in comparison to externalizing behaviors, which may be more observable in their effects on children's functioning. As parent perceived burden is a strong predictor of children's health care use (Angold, Messer, Stangl, Farmer, Costello & Burns, 1998), this highlights a potential reason as to why increased expenditures are seen as associated with behavior problems. Our follow-up analyses found that both internalizing and externalizing behaviors served as significant mediators, with both models accounting for approximately the same amount of variance in acute care expenditures (7.7% vs. 7.2%, respectively). While our study can not explain the specific mechanisms by which these different types of behavior and emotional problems could impact acute care expenditures, the current data suggests that both types of problems are potentially important pathways of effect that should be examined in future prospective research.

To better understand the role of quality of life in our model, mediational analyses of each of the four subscales of quality of life (physical, emotional, social, and school quality of life) were completed. Our analyses found that only the social quality of life domain mediated the relationship between peer victimization and health care costs. Previous research has found that peer victimization significantly affects social functioning in children, across domains including social adjustment, development, and behaviors (Hawker & Boulton, 2000; Nansel et al., 2001). Similar to effects seen in other domains of psychosocial functioning, these detrimental effects of victimization may potentially lead to physical symptoms associated with psychological difficulties, the avoidance of social situations through faking physical illnesses, or social anxiety. Each of these can be considered components of social quality of life. This in turn could impact health care costs through the increased use of services to address these symptoms.

School quality of life as measured in the current study examined quality of life associated with school performance. Physical quality of life in this measure primarily examined physical abilities (e.g. walking, running, and lifting heavy objects), as opposed to physical symptoms. Here, it is not surprising that these two scales did not serve as significant mediators in that difficulties in these domains are not often associated with increased victimization. It was surprising, however, that the emotional quality of life domain was not seen to act as a significant mediator, given the previous associations seen between peer victimization, internalizing symptoms, and acute care costs. This could potentially be due to the more abstract concepts (such as emotions) often associated with measurements in this domain, which may not be as easily identified in measures completed by children. Concrete elements such as those associated with social situations may better capture a child's level of understanding when attempting to examine the relationship between victimization and a measure of quality of life.

Finally, we examined health care cost data broken down by acute care and well-check visits. Costs associated with acute care visits were examined as the primary outcome variable as this allowed for the inclusion of costs for visits which were primarily patient initiated. Well-check costs were examined in follow-up analyses to determine if the effects of victimization on health care costs were associated specifically with acute visits, or if this relationship would be seen across both types of health care use. Follow-up analyses determined that the effects of victimization on health care costs were specific to expenditures associated with acute care. This finding makes sense, given that acute visits are not mandated for school physicals or immunization needs (as well-check visits are), but instead reflect brief visits involving treatments of symptoms which are considered more pressing or severe.

Limitations and Strengths

There are several limitations in this study which should be taken into account when interpreting its findings. One weakness is that the variance which peer victimization predicts in acute health care costs is relatively low (2.4%). However, research usually accounts for, at most, about 30 to 40% of the variance in health care use in children with the inclusion of a wide range of variables (Janicke & Finney, 2000). Each additional variable which adds to our knowledge in this domain is important. While the variance predicted when looking at the direct relationship between peer victimization and acute care costs was relatively low, the inclusion of psychosocial functioning as a mediator in this relationship greatly increased the overall variance within our model, and allowed for a more detailed examination of these relationships.

The low variance explained by peer victimization on acute health care costs in our model may in part be explained by the unbalanced racial/ethnic background of the study participants. Recent statistics show African Americans as receiving more Medicaid services than whites or Hispanics (Bernstein, Makuc, Bilheimer, 2007). The racial/ethnic background of the current study participants reflected this trend. African American children tend to use less primary care services than other racial groups, and they tend to have lower health care costs associated with these services (Simpson et al., 2005). This too was reflected in the current sample, with acute care costs in African American children approximately half the size of such costs in Caucasian children. Perhaps a stronger relationship between peer victimization and health care costs would have been seen if the racial/ethnic distribution in the current sample was more balanced. Additionally, higher rates of emergency room visits are associated with lower SES and minority children (Simpson et al., 2005). In the current sample, the majority of the population was made up of African American children of low SES. Thus, by examining acute

care costs, health care costs associated with what may be more commonly used as a first-line of treatment among this group of children may have been missed.

An additional limitation is that data was gathered from primary care clinics in one county and only included Medicaid participants, limiting the generalizability of the current study. However, the demographic variables of the current study participants are similar to those of Medicaid participants overall. Another limitation is that the study involves the analysis of cross-sectional (psychosocial functioning: CBCL, PedsQL; and victimization: SEQ) and retrospective (health care costs and presence of a mental health diagnosis) data. Cross-sectional designs are useful when the purpose of a study is to find the prevalence of an outcome of interest, for the population or subgroups within the population at a given time-point. On the other hand, these designs present a limitation in that data is not provided over the long-term, which can be important when looking at variables which may fluctuate over time, such as those associated with health care (Levin, 2006). Health care cost data in the current study was collected retrospectively from the Medicaid claims database, thus the health care use examined occurred prior to the administration of the self-report psychosocial functioning and peer victimization data. Additionally, the data utilized for the presence of a mental health diagnosis created a dichotomous yes/no variable based on the presence of mental health ICD-9 codes at any time point over the year prior to the initial participant contact. Thus, it is unknown as to whether diagnoses were ongoing at the time the questionnaires were administered. The use of this cross-sectional and retrospective data did not allow for causal or predictive conclusions to be established. Additionally, two of the variables representing psychosocial functioning (child report of quality of life and parent report of total behavior problems) were subject to limitations caused by self-report. Utilizing self-report measures has the potential of producing biased

information with the underreporting of symptoms, which is often due to social desirability factors, especially in medical research settings. However, self-report measures are unique in that they can allow for an easier gathering of information about the participant which is often not easy to obtain through behavioral observation.

The current study also has several strengths. One methodological strength was the use of multiple sources to create variables representing psychosocial functioning in children. This allowed for the analysis of several domains of psychosocial functioning across child, parent, and health care provider report. The inclusion of a variable based on the presence of a mental health diagnosis (as determined by ICD-9 codes) as one of the variables of psychosocial functioning allowed for a variable without the inherent weaknesses caused by self-report data. The other variables, while based on self-report data, allowed for psychosocial functioning to be examined across a continuum. This allowed for further analysis of the individual sub-domains of psychosocial functioning within each of these measures.

An additional strength of the current study is that the report of health care cost data was collected from the Florida Medicaid claims databases. The use of databases such as those created by insurance companies is considered optimal when examining health care utilization variables as they provide more accurate and reliable information through objective records than that provided through self-report (Diehr, et al., 1999). Medicaid databases have consistent claims information based on state specific information which is monitored for quality and standardized, thus making it ideal for such research (Diehr, et al., 1999). Given that approximately 60% of health care costs in the United States are through government and state funded agencies such as Medicaid, this sample is representative of a significant number of children receiving health care services in this country.

Future Directions

The current study was able to examine the relationship between peer victimization and acute health care costs, with the inclusion of several variables representing psychosocial functioning acting as mediators in this relationship. Future research would first benefit from utilizing a prospective design with health care cost data collected from a larger sample, which would allow for the examination of causal relationships. Larger samples would also allow for the use of path analysis to further examine the relationship between peer victimization and acute care costs in the presence of additional variables. For example, social support may act as a buffer, protecting children from some of the negative effects associated with peer victimization (Bearman & La Greca, 2002; Janicke et al., 2008). The inclusion of variables such as receipt of prosocial support as a potential moderator of peer victimization on psychosocial functioning and health care expenditures in more complex models may help to better outline these complicated relationships.

The current study examined overall peer victimization, collapsing across overt and covert victimization sub-types. Future research would benefit from examining overt and covert victimization variables separately, as well as examining their combined effects (total peer victimization). These different types of victimization may be associated with different outcomes, and may occur more or less frequently in boys versus girls (Crick & Bigbee, 1998; Lunde et al., 2006). Overt victimization may be associated with physical injuries, which could also influence health care costs, those associated with acute care and emergency care in particular.

Future research would also benefit from examining other types of health care costs, such as those associated with emergency room visits. The current study was able to differentiate between acute care costs (significantly related to peer victimization), and costs associated with well-check visits (not significantly related to peer victimization). Often, higher rates of

emergency room visits are associated with lower SES and minority children (Simpson et al., 2005). As previously noted, the current study participants may have used higher rates of emergency care, which were not able to be examined. Additionally, previous findings indicate that higher rates of victimization are associated with higher medication use in children to treat symptoms such as headaches and stomach upsets (Due et al., 2007). Investigating costs associated with medication use, and the potential impact of peer victimization on these costs may also increase our understanding in this domain.

Examining the effects of peer victimization on health care costs, controlling for other health variables, such as the presence of a chronic health condition may also be warranted in future studies. Children with chronic health conditions utilize more health care services (Janicke & Finney, 2000), and are often the recipients of peer victimization (Janicke et al., 2008; Storch & Ledley, 2005). Differential rates of victimization and its effects may also be seen in chronic illness groups with higher rates of observable differences related to their condition. Some examples might include children who are overweight, those who practice observable adherence behaviors, or those whose medication side effect profiles have visible effects. Examining these variables together may provide a different picture, allowing for the examination of the effects of peer victimization in specific groups, and further, the effects of this victimization on health care use. Specific points of intervention in chronic illness groups may be seen, with previous research hypothesizing that more favorable affective responses and attitudes towards children in chronic illness groups will exist if such problems are explained as beyond a child's control (Bell & Morgan, 2000). Here, increased tolerance and decreased victimization in these special populations may have positive impacts on health care costs.

Clinical Implications

In the current study, the significant relationship between peer victimization and acute care costs was best explained when including psychosocial functioning as a mediator, outlining a potential pathway through which increased victimization rates may affect acute care costs. As higher costs for patient initiated visits in our model are associated with increased peer victimization and its effects on psychosocial functioning, the current data may reflect a trend towards less than optimally targeted health care use. Parents may be repeatedly using their children's primary care providers as a source of treatment for psychological or psychosomatic symptoms. Long-term use of the primary care physician may not be the most appropriate and effective source of treatment for some of these issues (Janicke & Finney, 2000). This can place an unnecessary burden on the health care system and the agencies which fund it as these symptoms may be more appropriately addressed and treated through psychological services. Given that national health care costs are rapidly rising, managing these costs while still ensuring that proper health care needs are being met is pertinent. The findings in the current study are indicative of at least one domain (peer victimization and its effects on psychosocial functioning), where further research and future interventions are warranted to hopefully see an effect on acute care costs.

It is expected that prospective research examining the effects of peer victimization on children's health care costs will allow for causal relationships to be established. With an increased understanding of potential pathways in these relationships, specific points of intervention may be identified. By addressing the negative impacts of peer victimization on children's mental health, an impact on acute health care use may be seen. Here, the implementation of programs designed to increase self esteem, teach appropriate conflict

resolution and communication skills, and decrease victimization overall could potentially decrease the negative effects of victimization.

Additionally, an increase in provider awareness is necessary to increase the recognition of the deleterious effects of peer victimization on children's mental health and how this may impact their physical symptoms and presentation in a primary care setting. It has been suggested that an assessment of victimization in children should occur during physician visits, especially when children and adolescents present with unexplained psychosomatic and behavior symptoms (Lyznicki et al., 2004), or when seeing children with repeated common health ailments or school worries (Wolke et al., 2001). Primary care treatment would benefit from an interdisciplinary approach to children's health care, with treatment teams including providers of psychological services. Alternatively, use of referrals by primary care physicians to professionals specializing in children's psychological functioning may increase the appropriate use of these services. Long term positive effects on children's health care costs may be seen if psychosocial difficulties (including those specifically associated with peer victimization) are identified and addressed, and if symptoms associated with these difficulties are understood as potentially separate from symptoms associated with biologically driven illnesses.

LIST OF REFERENCES

- Achenbach, T. M. (1991). Integrative guide to the 1991 CBCL/4-18, YSR, and TRF profiles. Burlington.
- Achenbach, T. M., & Rescorla, L.A. (2001). Manual for the ASEBA School-age forms & profiles. Burlington.
- Angold, A., Messer, S.C., Stangl, D., Farmer, E.M., Costello, E.J., & Burns, B.J. (1998). Perceived parental burden and service use for child and adolescent psychiatric disorders. *American Journal of Public Health*, 88(1), 75-80.
- Baron, R. M., & Kenny, D.A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173-1182.
- Bingham, C. R., Loukas, A., Fitzgerald, H. E., & Zucker, R. A. (2003). Parental ratings of son's behavior problems in high-risk families: Convergent validity, internal structure, and interparent agreement. *Journal of Personality Assessment*, 80(3), 237 - 251.
- Bell, S.K., & Morgan, S.B (2000). Toward a peer presented as obese: Does a medical explanation for the obesity make a difference? *Journal of Pediatric Psychology*, 25(3), 137-145.
- Bernstein, A. B., Makuc, D. M., & Bilheimer, L. T. (2007). *Health, United States, 2007*. Retrieved October, 2008
- Bond, L., Carlin, J. B., Thomas, L., Rubin, K., & Patton, G. (2001). Does bullying cause emotional problems? A prospective study of young teenagers. *British Medical Journal*, 323(7311), 480-484.
- Champion, K., Vernberg, E., & Shipman, K. (2003). Nonbullying victims of bullies: Aggression, social skills, and friendship characteristics. *Journal of Applied Developmental Psychology*, 24(5), 535-551.
- Coie, J. K., & Dodge, K.A. (1998). Aggression and antisocial behavior. In Damon W., Eisenber, N., (Ed.), *Handbook of child psychology* (Vol. 3, pp. 779-862). New York: John Wiley & Sons.
- Crick, N. R., & Bigbee, M.A. (1998). Relational and overt forms of peer victimization: A multiinformant approach. *Journal of Consulting and Clinical Psychology*, 66(2), 337-347.
- Crick, N. R., & Dodge, K.A. (1994). A review and reformulation of social information-processing mechanisms in children's social adjustment. *Psychological Bulletin*, 115(1), 74-101.
- Crick, N. R., & Grotpeter, J.K. (1996). Children's treatment by peers: Victims of relational and overt aggression. *Development and Psychopathology*, 8(2), 367-380.

- Diehr, P., Yanez, D., Ash, A., Hornbrook, M., & Lin, D. Y. (1999). Methods for analyzing health care utilization and costs. *Annual Review of Public Health*, 20(1), 125-144.
- Due, P., Hansen, E. H., Merlo, J., Andersen, A., & Holstein, B. E. (2007). Is victimization from bullying associated with medicine use among adolescents? A nationally representative cross-sectional survey in Denmark. *Pediatrics*, 120(1), 110-117.
- Facts on the cost of health insurance and health care. (2009). Retrieved 01/15/2009
- Fekkes, M., Pijpers, F. I. M., Fredriks, A. M., Vogels, T., & Verloove-Vanhorick, S. P. (2006). Do bullied children get ill, or do ill children get bullied? A prospective cohort study on the relationship between bullying and health-related symptoms. *Pediatrics*, 117(5), 1568-1574.
- Gini, G. (2007). Associations between bullying behaviour, psychosomatic complaints, emotional and behavioural problems. *Journal of Paediatrics and Child Health*, 44(9), 492-497.
- Graham, S., Juvonen, J. (1998). Self-blame and peer victimization in middle school: An attributional analyses. *Developmental Psychology*, 34(3), 587-599.
- Greco, L. A., Freeman, K.E., Dufton, L. (2007). Overt and relational victimization among children with frequent abdominal pain: Links to social skills, academic functioning, and health service use. *Journal of Pediatric Psychology*, 32(3), 319-329.
- Hanish, L. D., Guerra, N.G. (2002). Aggressive victims, passive victims, and bullies: Developmental continuity of developmental change? *Merrill-Palmer Quarterly*, 50(1), 17-38.
- Hawker, D. J., Boulton, M.J. (2000). Twenty years' research on peer victimization and psychosocial maladjustment: A meta-analytic review of cross-sectional studies. *Journal of Child Psychology and Psychiatry*, 41(4), 441-455.
- Hayden-Wade, H. A., Stein, R. I., Ghaderi, A., Saelens, B. E., Zabinski, M. F., & Wilfley, D. E. (2005). Prevalence, characteristics, and correlates of teasing experiences among overweight children vs. non-overweight peers. *13(8)*, 1381-1392.
- Hodges, E. V. E., Perry, D.G. (1999). Personal and interpersonal antecedents and consequences of victimization by peers. *Journal of Personality and Social Psychology*, 76(4), 677-685.
- Holmbeck, G. N. (2002). Post-hoc probing of significant moderational and mediational effects in studies of pediatric populations. *Journal of Pediatric Psychology*, 27(1), 87-96.
- Hommel, K. A., Davis, C. M., & Baldassano, R. N. (2008). Medication adherence and quality of life in pediatric inflammatory bowel disease. *Journal of Pediatric Psychology*, 33(8), 867-874.
- Horwitz, S. M., Morganstern, H., & Berkman, L.F. (1985). The use of pediatric medical care: A critical review. *Journal of Chronic Diseases*, 38(11), 935-945.

- Jacobs, A. K. (2007). Components of evidence-based interventions for bullying and peer victimization. In Steele, R. G. Elkin, T.D., Roberts, M.C. (Ed.), *Handbook of evidence-based therapies for children and adolescents: Bridging science and practice* (Vol. 1).
- Janicke, D. M. & Finney, J.W. (2000). Determinants of children's primary health care use. *Journal of Clinical Psychology in Medical Settings*, 7(1), 29-39.
- Janicke, D. M., Gray, W.N. Kahhan, N.A. Follansbee Junger, K.W. Marciel, K.K. Storch, E.A., & Jolley, C.D. (2008). Brief report: The association between peer victimization, prosocial support, and treatment adherence in children and adolescents with Inflammatory Bowel Disease. *Journal of Pediatric Psychology*, In Press.
- Janssen, I., Craig, W. M., Boyce, W. F., & Pickett, W. (2004). Associations between overweight and obesity with bullying behaviors in school-aged children *Pediatrics*, 113(5), 1187-1194.
- Larson, K., McCarthy, B. (2008). Allina Medical Clinic guide for the care of children. Retrieved 02/10/2008
- Lavigne, J. V, Binns, H.J. Arend, R., Rosenbaum, D., Christoffel, K.K., Hayford, J.R., & Gibbons, R.D. (1998). Psychopathology and health care use among preschool children: A retrospective analysis. *Journal of the Academy of Child and Adolescent Psychology*, 37, 262-270.
- Lunde, C., Frisen, A., & Hwang, C.P. (2006). Is peer victimization related to body esteem in 10-year-old girls and boys? *Body Image*, 3(1), 25-33.
- Lyznicki, J. M., Mccaffree, M.A., & Robinowitz, C.B. (2004). Childhood bullying: Implications for physicians. *American Family Physician*, 70, 1723-1728, 1729-1730.
- Mackinnon, D. P., & Dwyer, J. H. (1993). Estimating mediated effects in prevention studies. *Evaluation Review*, 17(2), 144-158.
- McCormick, M. C., Kass, B., Elixhauser, A., Thompson, J., & Simpson, L. (2000). Annual report on access to and utilization of health care for children and youth in the United States. *Pediatrics*, 105(1), 219-230.
- Nansel, T. R., Craig, W., Overpeck, M. D., Saluja, G., & Ruan, W. J. (2004). Cross-national consistency in the relationship between bullying behaviors and psychosocial adjustment. *Archives of Pediatric & Adolescent Medicine*, 158(8), 730-736.
- Nansel, T. R., Overpeck, M., Pilla, R. S., Ruan, W. J., Simons-Morton, B., & Scheidt, P. (2001). Bullying behaviors among US youth: Prevalence and association with psychosocial adjustment. *The Journal of the American Medical Association*, 285(16), 2094-2100.
- Olweus, D. (1994). Bullying at school: Long-term outcomes for the victims and an effective school based intervention program. In Huesmann, L. R. (Ed.), *Aggressive Behavior: Current Perspectives* (pp. 97-130). New York: Plenum Press.

- Or, Z. (2000). Health data 2001: A comparative analysis of thirty countries. Determinants of health in industrialized countries: A pooled, cross-country, time series analyses. Paris.
- Prinstein, M. J., Cheah, C. S. L., & Guyer, A. E. (2005). Peer victimization, cue interpretation, and internalizing symptoms: Preliminary concurrent and longitudinal findings for children and adolescents. *Journal of Clinical Child & Adolescent Psychology*, 34(1), 11 - 24.
- Puhl, R. M., & Latner, J.D. (2007). Stigma, obesity, and the health of the nation's children. *Psychological Bulletin*, 133(4), 557-580.
- Putallaz, M., Grimes, C. L., Foster, K. J., Kupersmidt, J.B., Coie, J.D., & Dearing, K. (2007). Overt and relational aggression and victimization: Multiple perspectives within the school setting. *Journal of School Psychology*, 45(5), 523-547.
- Rabbet, H., Elbadri, A., Thwaites, R., Northover, H., Dady, I., Firth, D., Hillier, V.F., Miller, V., & Thomas, A.G. (1996). Quality of life in children with Chron's Disease. *Journal of Pediatric Gastroenterology & Nutrition*, 23(5), 528-533.
- Riley, A., W. Finney, J.W., Mellits, D., Starfield, B., Kidwell, S., Quaskey, S., Cataldo, M.F., Filipp, L., & Shematek, J.P. (1993). Determinants of children's health care use: An investigation of psychosocial factors. *Medical Care*, 31, 767-783.
- Ronning, J. A., Sourander, A., Kumpulainen, K., Tamminen, T., Niemala, A., Moilanen, I., Helenius, H., Piha, J., & Almqvist, F. (2008). Cross informant agreement about bullying and victimization among eight-year-olds: Whose information best predicts psychiatric caseness 10-15 years later. *Social Psychiatry and Psychiatric Epidemiology*.
- Simpson, L., Owens, P. L., Zodet, M. W., Chevarley, F. M., Dougherty, D., Elixhauser, A., & McCormick, M. C. (2005). Health care for children and youth in the United States: Annual report on patterns of coverage, utilization, quality, and expenditures by income. *Ambulatory Pediatrics*, 5(1), 6.
- Storch, E. A., & Ledley, D. R. (2005). Peer victimization and psychosocial adjustment in children: Current knowledge and future directions. *Clinical Pediatrics*, 44(1), 29-38.
- Storch, E. A., Brassard, M. R., & Masia-Warner, C.L. (2003). The relationship of peer victimization to social anxiety and loneliness in adolescence. *Child Study Journal*, 33(1), 1-18.
- Storch, E. A., Nock, M.K., Masia-Warner, C., & Barlas, M.E. (2003). Peer victimization and social-psychological adjustment in Hispanic and African-American children. *Journal of Child and Family Studies*, 12(4), 439-452.
- Van Cleave, J., & Davis, M. M. (2006). Bullying and peer victimization among children with special health care needs. *Pediatrics*, 118(4), 1212-1219.

- Varni, J. W., Seid, M., & Kurtin, P.S. (2001). PedsQL (TM) 4.0: Reliability and validity of the pediatric quality of life inventory (TM) version 4.0 generic core scales in healthy and patient populations. *Medical Care*, 39(8), 800-812.
- Wilkins-Shurmer, A., O'Callaghan, M. J., Najman, J. M., Bor, W., Williams, G. M., & Anderson, M. J. (2003). Association of bullying with adolescent health-related quality of life. *Journal of Paediatrics and Child Health*, 39(6), 436-441.
- Wolfe, B. L. (1980). Children's utilization of medical care. *Medical Care*, 23, 1196-1207.
- Wolke, D., Woods, S., Stanford, K., & Schulz, H. (2001). Bullying and victimization of primary school children in England and Germany: Prevalence and school factors. *British Journal of Psychology*, 92, 673-696.
- Woodward, C. A., Boyle, M.H., Offord, D.R., Cadman, D.T., Links, P.S., Munroe-Blum, H., Byrne, C., & Thomas, H. (1988). Ontario child health study: Patterns of ambulatory medical care utilization and their correlates. *Pediatrics*, 82, 425-434

BIOGRAPHICAL SKETCH

Nicole Kahhan received her bachelor's degree from the University of Florida in May, 2007. She majored in psychology and minored in family, youth, and community science. She is currently a master's degree candidate in the Department of Clinical and Health Psychology at the University of Florida. She received her master's degree in May 2009, and is currently continuing her doctoral training in clinical psychology with a focus in pediatric psychology.