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Parental Involvement of Mothers With Chronic Illness and Children's Academic Achievement

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Abstract

This study examined how maternal chronic illnesses may affect children's academic achievement through parental involvement. A total of 189 mothers diagnosed with chronic illnesses, such as multiple sclerosis, diabetes, cancer, HIV/AIDS, chronic pain, asthma, myelodysplasic syndrome, and fibromyalgia, and with a child in middle school or high school (age 10-18 years) completed questionnaires assessing the demands of illness on family functioning, parental involvement, and the child's academic functioning. The results suggested that the majority of children of mothers with chronic illness were able to function adequately in terms of academic achievement. However, children's academic functioning might be at risk when family functioning was more disrupted as the result of maternal illness. Children's grades were negatively related to levels of demands of illness on family functioning. Levels of illness demands were negatively related to parental self-efficacy. Moreover, parental self-efficacy attenuated the effects of disruption in normal family functioning on children's academic achievement.

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Family systems theory posits that a problem in any member of a family has an effect on all other members, and changes in any member of the system affect all others (e.g., Pedersen & Revenson, 2005). This suggests that a serious illness or disability is likely to affect the family system when a family member is unable to function normally, affecting all the other family members, including children as well as the family's overall functioning.

Parental physical illness is a stressful experience for children and adolescents (Pedersen & Revenson, 2005). In addition to the typical developmental challenges, children of parents with chronic illness may also have to cope with the threat of the loss of a parent, decreased parental availability, increased household responsibilities, changing schedules and routines, and the potential depletion of financial resources (Armistead, Klein, & Forehand, 1995; Korneluk & Lee, 1998). However, research with respect to risk for children of ill parents is still at a relatively early stage. While some studies (e.g., Grabiak, Bender, & Puskar, 2007; Shaffer, Jones, Kotchick, Forehand, & The Family Health Project Research Group, 2001) reported negative psychosocial and/or behavioral outcomes, such as depression, anxiety, academic, and behavior problems in children as a result of their parents' physical illnesses, some (e.g., De Judicibus & McCabe, 2006; Hoke, 2001) suggested that children of parents with a chronic illness do not function differently from those whose parents are not ill. Watson et al. (2006) argued that these inconsistencies may be because of variations between studies in the groups included and in how child functioning and problems are measured, together with difficulties in obtaining homogeneous samples with adequate sample sizes. The review conducted by Osborn (2007) indicated that children and adolescents of parents with chronic illnesses do not generally experience elevated levels of serious psychosocial difficulties, but they are at a slightly higher risk for internalizing or behavioral problems. The available literature on the effects of parental chronic illness on children's functioning has predominately emphasized the psychological and social aspects of adjustment in children but has not addressed academic functioning of children of chronically ill parents. The current study investigates the relationship between parental chronic illness and children's educational achievement applying theoretical models used in prior studies on psychosocial functioning.

As outlined in Lewis, Woods, Hough, and Bensley's (1989) model, parents' psychological functioning, marital adjustment, the parent–child relationship, child psychosocial functioning, and family coping styles are expected to play important roles in the family members' adaptation to illness. Similarly, Armistead et al.'s (1995) model addressing the child's adjustment to parental illness also focuses on the impact of disruptions to parenting when parents become ill. Furthermore, Lewis and Hammond (1996) suggested that illness-related demands impinging on the family are associated with higher levels of maternal depressive mood, poorer marital adjustment, and lower parenting quality, which may lead to impairments in their children's functioning.

Integrating Armistead et al.'s (1995) child adjustment to parental illness model and the findings of Lewis and Hammond's (1996) path analysis study seems to suggest that the demands of illness experienced by physically ill mothers may impinge on family functioning, such as maternal adjustment, parental depression, relationship conflicts, and parent–child relationship, which consequently causes disrupted parenting, affecting their children's functioning.

Although disrupted parenting has been seen as a leading mechanism operating to influence child functioning of parents with chronic physical illness (e.g., Armistead et al., 1995), little is known about how the possible disrupted parenting affects parents' involvement in the child's homework, school activities, and education in general. Dura and Beck (1998) reported that children from families of a parent with chronic pain tended to have more days absent from school than children of mothers with no illness. The results suggested that disrupted parenting because of parental physical illness is associated with compromised parental involvement in the student's school activities. Therefore, a primary objective of this study is to investigate the relationship between demands of parental illness and potential parenting disruption as reflected in parental involvement in their children's education.

Disruption in parental involvement when a parent is chronically ill is examined since prior research (e.g., Fan & Chen, 2001; Izzo, Weissberg, Kasprow, & Fendrich, 1999) has suggested a strong positive relationship between student achievement and parent involvement in education. Jeynes's (2007) meta-analysis examining the impact of parental involvement on academic achievement revealed positive relationships between parental involvement and all the academic measures studied, such as GPA and standardized tests, suggesting that parental involvement has a significant impact on children across academic outcomes. Similarly, Ballantine (1999) reported that children earned higher grades and test scores, had better school attendance, and were more likely to graduate from high school and attend college as a result of parental involvement. Furthermore, Gonzalez-DeHass, Willems, and Holbein (2005) identified a beneficial relationship between parental involvement and various social-motivational outcomes, such as school engagement, perceived competence, and self-regulation.

Different types of parent involvement such as parent–child communication (e.g., talking about children's school activities), home supervision (e.g., limiting TV and monitoring homework), educational aspirations for children, school contact and participation (e.g., volunteering in school and attending school meetings), and perceptions of parental efficacy have been found to be significantly linked to positive educational outcomes in children (e.g., Fan & Chen, 2001; Jeynes, 2007).

In a conceptual model proposed by Hoover-Dempsey and colleagues (Hoover-Dempsey & Sandler, 1995, 1997; Walker, Wilkins, Dallaire, Sandler, & Hoover-Dempsey, 2005), two levels of parental involvement are outlined to explain why parents get involved, what forms their involvement takes, and how their involvement influences children's learning and performance. Level I of this model depicts parental factors that affect their involvement, and parental motivational beliefs regarding their involvement (e.g., parental self-efficacy) are considered as one of the core Level I factors. Level II of this model outlines forms of parent involvement, and they are generally defined as both the school-based and the home-based behaviors. An empirical test of this theoretical model of parent involvement (Green, Walker, Hoover-Dempsey, & Sandler, 2007) revealed that both forms (school based and home based) of parental involvement (i.e., Level II constructs) were predicted by model Level I constructs, including parental self-efficacy in helping their child succeed in school, suggesting that this model offers a useful framework for understanding the parental involvement process.

This study explores the relationship between maternal chronic illness and potential parenting disruption as reflected in parental involvement in their children's education, as well as how the disruption may affect children's academic functioning. We adopted Hoover-Dempsey and colleagues' (Hoover-Dempsey & Sandler, 1995, 1997; Walker et al., 2005) two-level model of parental involvement in this study and examined how it is related to maternal chronic illness and children's academic achievement in school. We used parental self-efficacy as our Level I parental involvement variable in this study. Forms of parental involvement as Level II constructs studied in this study include educational aspirations, grade expectations, school contact and participation, home supervision, and parent–child communication.

In sum, as parental involvement has been identified as a critical factor in predicting students' academic achievement, Armistead et al.'s (1995) child adjustment model of parental illness appears to suggest that the child's educational activities and performance may be compromised as a result of parental chronic illness. Guided by both Lewis et al.'s (1989) and Armistead et al.'s theoretical frameworks, this study investigated the degree of parental involvement of mothers with chronic illness in their children's academic activities and its relation to children's educational achievement. The relationship between demands of illness (e.g., the family hardship or difficulties derived from physical illness) and parental involvement in their children's education (Level I—parental self-efficacy and Level II—home- and school-based activities) depicted in Hoover-Dempsey and Sandler's (1995, 1997) parental involvement model as well as children's academic performance were examined in this study. We hypothesized that higher illness demands would be related to lower levels of parental self-efficacy and lower educational performance in children. In addition, positive parental involvement as a potential factor that mediates the effects of parental chronic illness on children's educational functioning was examined. Finally, we expected to find the observed educational outcomes to be a result of belief/attitudinal differences in levels of parental self-efficacy.

Method

Participants

Data were collected from 189 mothers diagnosed with chronic illness who had at least one middle school– or high school–aged child. Participants were recruited from health care (e.g., Joslin Diabetes Center), social agencies (e.g., Whitter Rio Hondo AIDS Project, Breast Cancer Connections, etc.), and national organizations (e.g., chapters of National Multiple Sclerosis Society) serving chronically ill patients across the country. Mothers ranged in age from 28 to 58 years (M = 43.2, SD = 6.3), were largely Caucasian (87%), and married (71%). Other ethnicities included Asian (2%), Black (6%), Hispanic/Latino (4%), and Mixed (1%). Participants resided in 27 different states, with 26% of the sample living in Ohio, 16% in California, 9% in Florida, and 21% in the Northeast region. More than half (59%) of mothers were diagnosed with multiple sclerosis, 22% with diabetes, 11% with cancers, 6% with HIV/AIDS, 3% with chronic pain, asthma, myelodysplastic syndrome, and fibromyalgia. Because of rounding, the percentages may not add up to 100%. As some researchers (e.g., Anderson & Hammen, 1993;

Hirsch, Moos, & Reischl, 1985; Welch, Wadsworth, & Compas, 1996) suggested that the principal risk factors for children and adolescents of chronically ill parents may be the presence of parental disability or distress, rather than a specific parental diagnostic category that places children at risk, we decided to include mothers with different types of chronic illness in this study. With respect to the onset of illness, the sample included mothers who had been diagnosed with their primary illness for less than 1 year and those who had been living with their illness for more than 40 years, with the average years since diagnosis of 8.9 (*SD* = 7.7). The sample of children reported by the participants included 82 (43%) boys and 107 (57%) girls, with a range in age between 10 and 18 years (*M* = 14.2, *SD* = 2.1), who were 5th- (4%), 6th- (13%), 7th- (16%), 8th- (11%), 9th- (19%), 10th- (8%), 11th- (12%), and 12th- (17%) grade students. All the children were residing with their ill mother at the time of the study.

Measures

Parent medical information. Mothers completed questions regarding their health/medical conditions, such as diagnoses, onset of illness, and interventions/treatments received.

Demands of illness. The revised Demands of Illness Inventory (DOII; Woods, Haberman, & Packard, 1993) measures the family hardship or difficulties that arise over the course of an illness that need to be managed. The 35-item subscale of family functioning on the DOII was used to determine the impact of disrupted family functioning as the result of maternal chronic illness on parental involvement and children's academic functioning. Scale items are rated on a 5-point Likert-type scale ranging from 0 = *not at all* to 4 = *extremely*. Higher DOII scores indicate a higher intensity of demands of illness on family functioning, ranging from 0 to 140. Evidence supporting the reliability and validity of DOII has been reported (Haberman, Woods, & Packard, 1990). Scores on the family functioning subscale have been related to measures of marital quality, family satisfaction, family adaptation, and cohesion (Woods et al., 1993), as well as measures of depression (Hough, Lewis, & Woods, 1991). A prior study (Woods et al., 1993) indicated good reliability for the family functioning subscale for the intensity of demand scores ($\alpha = .92$). In the present study, the alpha coefficient for the subscale of family functioning of DOII was .97.

Parental self-efficacy. The 11-item parental self-efficacy scale adapted from Hoover-Dempsey, Bassler, and Brissie (1992) was used to measure parental self-efficacy for helping the child succeed in school. Mothers were asked to rate their beliefs in their capability to act in ways that will produce positive influences in their children's school performance on a 6-point Likert-type scale, ranging from a 1 (*strongly disagree*) to a 6 (*strongly agree*). This scale has demonstrated adequate reliability in past research (Hoover-Dempsey et al., 1992) and yielded good reliability in the current sample ($\alpha = .90$).

Educational aspirations/grade expectations for children. Parental aspirations and expectations toward their children's education were assessed in two dimensions: educational attainment aspirations and grade expectations. We adapted three items used in Okagaki and Frensch's (1998) study to measure parents' educational attainment aspirations. Mothers were asked to indicate (a) the ideal amount of education they would like their child to attain, (b) how much education they expect their child to obtain, and (c) what the very least amount of schooling they would allow their child to attain would be, ranging from 1 = *complete some high school education* to 6 = *get a graduate or professional degree* for each item. This three-item scale obtained adequate internal consistency reliability in this present sample ($\alpha = .75$).

The grade expectations measure developed by Okagaki and Frensch (1998) was adapted and modified to assess the parents' expectations regarding their child's grades. Mothers were asked to rate how they would feel if their child brought home certain grades (A to F) on a 7-point Likert-type scale, ranging from a 1, meaning *extremely upset*, to a 7, meaning *extremely happy*. A diagonal scoring scheme (see the appendix) was used to calculate the parent's grade expectation for her child. The total score of this measure ranges from −10 to 20 ($\alpha = .78$), with higher scores indicating higher levels of grade expectations.

School contact and participation. Cooper and Crosnoe's (2007) eight-item scale of parental involvement in education was used to measure parents' engagement in schooling of their child with respect to what extent and how frequently they participate in their child's school activities, contact teachers regarding their child's learning or behavior, volunteer in school, and attend educational meetings and school social functions. The extent of school contact and participation was assessed using the summation of all eight items, with higher scores indicating more parental involvement in children's education ($\alpha = .64$).

Home supervision. Four items from the parental involvement indices of National Educational Longitudinal Study of 1998 (NELS:88) were revised to measure parents' involvement with the daily supervision of their child's life and educational activities at home. The original student-report home supervision–related items have been adapted and used in many studies (e.g., Fan, 2001; Hong & Ho, 2005). In this study, mothers were asked to rate on a 5-point scale (1 = *never* to 5 = *always*) how frequently they monitor when their child returns from school and what they do after school, and oversee time their child spent on homework and the extent to which their child goes out with friends, watches television, or plays video games. The total score is the sum of the ratings for the four items ($\alpha = .75$), with higher scores indicating more parental involvement in terms of home supervision.

Parent–child communication. Parent–child communication about school-related matters was assessed by the six-item Parent Involvement in School Interview developed by Resnicow (SAMHSA's Prevention Platform, n.d.). Mothers were asked to indicate the frequency of their systematic discussions with their children about schoolwork and school-related activities on a 5-point rating scale (1 = *never* to 5 = *very often*). The total score is the summation of the ratings of all six items included in the scale, with higher scores indicating higher frequency of parent–child communication. A prior study indicated an acceptable alpha test–retest reliability of .80 (SAMHSA's Prevention Platform, n.d.) and this present study yielded an adequate internal consistency reliability ($\alpha = .83$).

Children's educational outcomes. Children's academic achievement was assessed by a parent rating on a scale used in a study by Fehrmann, Keith, and Reimers (1987), indicating the child's grades are "Mostly As (or a numerical average of 90-100)," "About half As and half Bs (or 85-90)," "Mostly Bs (or 80-84)," "About half Bs and half Cs (or 75-79)," "Mostly Cs (or 70-74)," "Mostly Cs and Ds (or 65-69)," "Mostly Ds (or 60-64)," or "Mostly below D (or below 60)."

Procedure

The first author contacted national organizations, clinics/hospitals, and social support groups that served adult patients with chronic illness, such as diabetes, cancers, multiple sclerosis, HIV/AIDS, in the United States and asked for permission and assistance to recruit research participants. The participant recruitment information was disseminated by the approved organizations through their literature and publications, online announcement, and fliers posted in their facilities.

Among 253 questionnaires that were sent out to the potential participants, 196 (78%) were completed and returned. The questionnaire took approximately an hour to complete. However, it might have varied as a result of the participants' illness. Each participant was compensated 10 dollars for completing the questionnaire. Seven respondents were excluded from data analyses because their children were not enrolled in middle school or high school, resulting in a total of 189 participants.

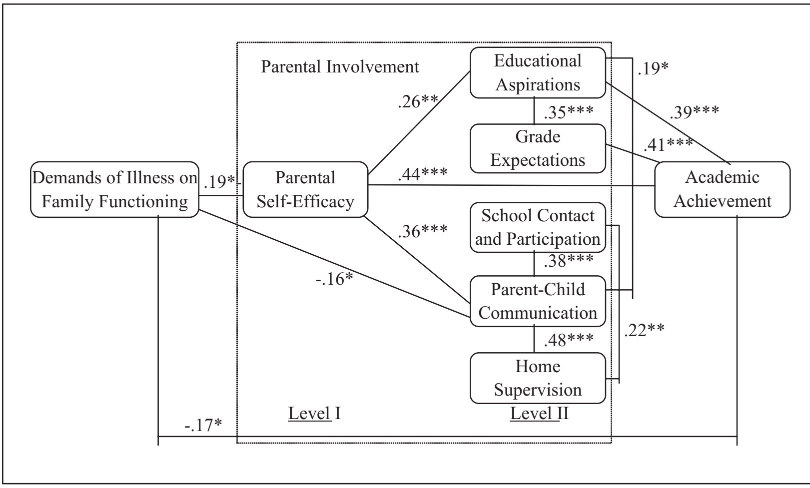

Figure 1. Overview of the relations between the main variables of study
Note: The figure presents a sequence of partial correlations. The lines between variables indicate significant partial correlations while controlling for sociodemographic characteristics, including maternal age, ethnicity, primary diagnosis, onset of illness, household income, child's gender, child's age, and child's grade level. All the coefficients are significant beyond the $p < .05$ level.

The mothers provided informed consent to take part in the study and were made aware they were free to withdraw from the study at any time for any reason. Confidentiality was ensured to all participants. Questionnaires, procedures, and informed consent forms and instructions were reviewed and approved by the institutional review board at The Graduate Center of the City University of New York. The research protocols were also reviewed and approved by the Joslin Diabetes Center and National Multiple Sclerosis Association.

Results

A visual presentation of the overview of the results as they correspond to the hypothesized model tested in the present study is provided in Figure 1.

Children's Academic Functioning

According to maternal report of their child's grades, 39% of children in the sample received mostly As (or a numerical average of 90-100), 22% received

Table 1. Partial Correlations Among Study Variables After Controlling Sociodemographic Factors

	1	2	3	4	5	6	7	8
DOII family functioning	—	−.19*	−.13†	−.04	−.01	−.16*	−.04	−.17*
Parental self-efficacy		—	.26**	.07	.14†	.36***	.14†	.44***
Educational aspirations			—	.35***	.13†	.19*	−.02	.39***
Grade expectations				—	.03	−.02	−.09	.41***
School contact					—	.38***	.22**	.06
Parent–child communication						—	.48***	.07
Home supervision							—	−.14
Child's grades								—
Mean	58.16	41.39	12.78	5.07	16.49	21.37	14.02	6.43
SD	30.81	7.58	2.86	3.30	15.14	4.90	3.19	1.83

Note: DOII = Demands of Illness Inventory. Higher subscale scores of family functioning on the DOII indicate more disruption in family functioning.
†p < .10. *p < .05. **p < .01. ***p < .001.

about half As and half Bs (or 85-90), 15% received mostly Bs (or 80-84), 9% received about half Bs and half Cs (or 75-79), 5% received mostly Cs (or 70-74), 6% received mostly Cs and Ds (or 65-69), 1% received mostly Ds (or 60-64), and 3% received mostly below D grades (or below 60). Overall, approximately 76% of children in the sample of this study obtained mostly As and Bs (or a numerical average of 80 and above), suggesting that the majority of children in the sample of this study appeared to function adequately in terms of academic achievement.

Partial correlations among the main variables of this study after controlling for sociodemographic variables, such as maternal age, ethnicity, primary diagnosis, onset of illness, household income, child's gender, child's age, and child's grade level, are presented in Table 1.

Relationship Between Demands of Illness on Family Functioning and Children's Grades

Demands of illness experienced by mothers in terms of disruption in family functioning as indicated on the DOII were negatively correlated with their children's grades ($r = -.17$, $p = .024$; Table 1), suggesting that higher levels of compromised family functioning as the result of maternal illness were associated with children's lower grades in school, although the correlation is small, representing a small effect size (Cohen, 1992).

Relationship Between Demands of Illness on Family Functioning and Parental Involvement

We examined the relationship between demands of illness and parental involvement based on Hoover-Dempsey and colleagues' (Hoover-Dempsey & Sandler, 1995, 1997; Walker et al., 2005) two-level model. Disruption in family functioning as indicated on the family functioning subscale of DOII was negatively correlated with parental self-efficacy (Level I parents' motivational beliefs variable; $r = -.19$, $p = .011$; Table 1). Mothers who perceived higher levels of disruption in their family functioning tended to have lower levels of academic efficacy in helping their children succeed in school. In terms of Level II involvement variables, the subscale score of family function on DOII was negatively associated with parent–child communication regarding school matters ($r = -.16$, $p = .034$; Table 1). Mothers who experienced more intense demands of illness imposed on family functioning tended to engage in systematic discussions with their children about their school activities less frequently. However, there were no significant relationships between demands of illness and other forms of parental involvement (e.g., educational aspirations, grade expectations, school contact and participation, and home supervision).

Relationship Between Parental Involvement Variables and Children's Grades

Among parental involvement measures, parental self-efficacy, educational aspirations, and grade expectations were positively correlated with children's grades; $r = .44$, $p < .001$; $r = .39$, $p < .001$; and $r = .41$, $p < .001$, respectively (Table 1). Higher levels of perceived self-efficacy in helping their children succeed in school, higher expectations toward their children's educational achievement and grades were associated with higher grades obtained in school. The measures of parent–child communication, school contact, and participation in children's school activities, and home supervision, however, were not associated with children's grades.

Relationship Between Variables of Parental Involvement

Parental self-efficacy was related to different forms of parental involvement. The measure of parental self-efficacy was positively associated with

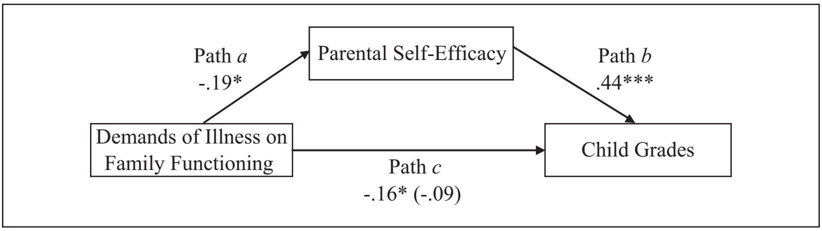

Figure 2. Parental self-efficacy as a mediator between family functioning and children's grades
Note: The numbers listed on Paths *a* and *b* represent the partial correlation coefficients after controlling for sociodemographic variables such as maternal age, primary diagnosis, onset of diagnosis, ethnicity, household income, child's gender, age, and grade level in school. The numbers listed on Path *c* are β values while controlling for the same sociodemographic variables.

measures of parental academic aspirations and parent–child communication; $r = .26$, $p = .001$, and $r = .36$, $p < .001$, respectively (Table 1). However, parent's self-efficacy was not significantly related to parental grade expectations, school contact, and home supervision.

Among different forms of parental involvement, the measure of parental academic aspirations was positively associated with levels of parental grade expectations and parent–child communication; $r = .35$, $p < .001$ and $r = .19$, $p = .014$, respectively (Table 1). However, parental academic aspirations were not correlated with school contact and participation and home supervision. The score of school contact and participation was positively correlated with levels of parent–child communication and home supervision; $r = .38$, $p < .001$ and $r = .22$, $p = .003$, respectively.

The Mediating Effect of Parental Self-Efficacy

Among different types of parental involvement, parental self-efficacy was the only variable that correlated with the measure of demands of illness on family functioning and the child's grades. As a result, only parental self-efficacy was tested as a possible factor that mediates the relationship between disruption in normal family functioning imposed by maternal illness demands and children's grades (see Figure 2).

According to Baron and Kenny (1986), a variable functions as a mediator when it meets the three conditions: (a) variations in levels of the independent variable significantly account for variations in the presumed mediator (i.e., Path *a* in Figure 2), (b) variations in the mediator significantly account for

Table 2. Hierarchical Multiple Regression Analysis: Parental Self-Efficacy as a Potential Mediator of Relation Between Demands of Illness on Family Functioning and Children's Grades

Step and Predictor	β	*t*	ΔR^2	*p*
Step 1			.23***	
Control variables				
Step 2			.02***	
Control variables				
DOII family functioning	−.16*	−2.28		.024
Step 3			.13***	
Control variables				
DOII family functioning	−.09	−1.30		.197
Parental self-efficacy	.39***	6.06		.000
Cumulative R^2 = .38***				
Final $F(10, 171) = 10.519$				

Note: Control variables include maternal age, ethnicity, primary diagnosis, onset of illness, household income, child's gender, child's age, and child's grade level. β = standardized beta coefficients; DOII = Demands of Illness Inventory.
*$p < .05$. **$p < .01$. ***$p < .001$.

variations in the dependent variable (i.e., Path *b* in Figure 2), and (c) when Paths *a* and *b* are controlled, a previously significant relation between the independent and dependent variables is no longer significant, with the strongest demonstration of mediation occurring when Path *c* is zero.

To test whether parental self-efficacy functioned as a mediator in this present study, the relations among the demands of illness on family functioning, parental self-efficacy, and children's grades were tested based on the three criteria. All three paths in the mediational model testing the relations among demands of illness on family functioning, parental self-efficacy, and the child's grades were significant. Parental self-efficacy was significantly associated with both demands of illness and parental rating on children's grades. Higher demands of parental illness on family functioning were related to lower levels of parental self-efficacy (i.e., Path *a* in Figure 2) and lower grades in their children (i.e., Path *c*). Higher levels of mothers' efficacy were related to higher grades in children (i.e., Path *b*).

A hierarchical regression was conducted to measure the unique and additive contribution of parental self-efficacy in explaining the relation between disrupted family functioning and children's grades. As shown in Table 2, when the hypothesized mediator (parental self-efficacy) was added to the model examining the relation between demands of illness on family functioning

Table 3. Hierarchical Multiple Regression Analysis: Unique and Additive Contribution of Parental Involvement to the Prediction of Child's Grades

Predictors	β	*t*	ΔR^2	*p*
Step 1			.23***	
Control variables				
Step 2			.02***	
DOII family functioning	−.16*	−2.25		.026
Step 3			.13***	
Parental self-efficacy	.39***	5.97		.000
Step 4			.15***	
Educational aspirations	.17*	2.61		.010
Grade expectations	.29***	4.51		.000
School contact	.21	.28		.777
Parent–child communication	−.04	−.55		.586
Home supervision	−.14*	−2.08		.039
Cumulative R^2 = .53***				
Final $F(15, 161)$ = 12.807				

Note: Control variables include maternal age, ethnicity, primary diagnosis, onset of illness, household income, child's gender, child's age, and child's grade level. β = Standardized beta coefficients; DOII = Demands of Illness Inventory.
*$p < .05$. **$p < .01$. ***$p < .001$.

and the children's grades, the magnitude of the relation was reduced from $\beta = -.16$, $p = .024$ to $\beta = -.09$, $p = .197$, and the measure of disrupted family functioning was no longer related to the children's grades. Using equations suggested by Sobel (1988), a z statistic was computed based on unstandardized beta weights and standard errors. The obtained z score of −3.94 exceeded the critical value of 1.96 for $p < .05$ significance, indicating that the amount of mediation was significant. The results suggest that parental self-efficacy attenuated the negative relationship between the disrupted family functioning and children's grades.

Additive Contributions of Different Forms of Parental Involvement to Children's Grades

As parental self-efficacy (Level I of parental involvement) has demonstrated its meditational effect on attenuating the negative relationship between illness demands on family functioning and children's educational achievement, we further explored whether different forms (Level II) of parental involvement add extra value in predicting the child's academic functioning. As shown in Table 3, after controlling for sociodemographic variables, maternal demands of illness, and parental self-efficacy, the variables of educational aspirations, grade expectations, and home supervision contributed uniquely and additively to predict the child's grades; $\beta = .17$, $p = .010$; $\beta = .29$, $p < .001$; and $\beta = -.14$, $p = .039$, respectively. The other forms of parent involvement, such as parental school contact and participation and parent–child communication regarding school matters did not contribute to the prediction of children's grades.

Discussion

The effects of parental illness on children's academic functioning have rarely been discussed in the literature. The present study was the first to systematically examine the relationship between maternal chronic illness and children's academic achievement through demands of illness on family functioning and parental involvement in education.

Similar to the findings with respect to children's psychosocial adjustment to parental chronic illness in the literature (e.g., Osborn, 2007), the results of this study also suggest that children may not generally experience serious academic difficulties as a majority of children in this study appeared to function well academically, suggesting resilience in children whose mothers were diagnosed with chronic illness. However, they may be at a slightly increased risk for lower academic achievement when the demands of illness or family hardship as the result of illness imposed on their mothers are high.

As expected, the demands of parental illness on family functioning were associated with some aspects of parental involvement. In this study, the mothers who experienced higher demands imposed by their illness and higher levels of disruption in normal family functioning tended to have lower levels of parental self-efficacy as they felt less confident in their ability to help their children succeed in school compared with those who experienced lower levels of illness demands and disruption in family functioning. In addition, chronically ill mothers with lower levels of parental self-efficacy tended to have lower educational aspirations for their children and tended to engage in communication with their children regarding education and school activities less frequently. Furthermore, the results of the present study showed that the levels of disruption in normal family functioning were negatively related to the child's grades. The children whose mothers experienced higher levels of disruption in family functioning imposed by their illness tended to have lower grades in school than those whose mothers experienced lower levels of illness demands. However, parental self-efficacy appeared to be a robust factor that mediated the negative relationship between the maternal demands of illness and children's educational performance.

Finally, the results of the present study are consistent with recent research on the role of parental involvement in children's academic functioning. Among different forms of parental involvement, parental educational aspirations and grade expectations were positively related to children's academic performance. The children whose mothers expected them to attain higher education and better grades tended to have better grades in school. However, some other forms of parental involvement, such as school contact and participation, home supervision, and parent–child communication, were not related to children's grades in this study. We speculate that chronically ill mothers in this sample might compensate for their inability to physically participate in their child's education by providing close supervision, active interactions, and communication with their child and his/her school by using more psychological support, such as higher educational aspirations and grade expectations.

Hoover-Dempsey and colleagues' (Hoover-Dempsey & Sandler, 1995, 1997; Walker et al., 2005) model provides a strong theoretical framework to examine specific predictors of parental involvement, and it recognizes parental self-efficacy for helping the child succeed in school as one of the major motivational beliefs relevant to involvement. Grounded in Bandura's (1997) work, parent efficacy was defined as a parent's belief that he/she is capable of exerting a positive influence on children's school outcomes (Hoover-Dempsey et al., 1992). When applying the self-efficacy theory to parental involvement, it is suggested that parents make involvement decisions based in part on their thinking about the outcomes likely to follow their involvement activities (Green et al., 2007; Walker et al., 2005).

Bandura's (1997) work suggests that persons high in efficacy will be more likely to engage in behaviors leading to a goal and will be more persistent in the face of obstacles than will persons with a lower sense of efficacy. Parents who believe that they can "make a difference" in their child's education are more likely to be involved (Hoover-Dempsey et al., 1992). Several studies have indicated that positive personal beliefs about efficacy for helping one's children succeed in school are associated with increased parental involvement among middle school (Bandura, Barbaranelli, Caprara, & Pastorelli, 1996) and high school (Shumow & Lomax, 2002) students. Supporting prior findings in the literature, the results of the present study involving chronically ill mothers also suggest that parents' efficacy in helping their children succeed in school was related to their involvement in their children's education through academic aspirations and parent–child communication in order to know and keep abreast of what is going on with the child in school. Bandura et al. (1996) suggested that parents' sense of academic efficacy and aspirations for their children are linked to their children's scholastic achievement through their perceived academic capabilities and aspirations. Children's beliefs in their efficacy to regulate their own learning and academic attainments, in turn, contribute to scholastic achievement both independently and by promoting high academic aspirations and prosocial behavior and reducing vulnerability to feelings of futility and depression (Bandura et al., 1996).

A meta-analytic study by Jeynes (2007) indicated that parental expectations, family communication, checking homework, parental participation, or attendance in school events, were positively and significantly correlated to children's educational outcomes. Integrating Hoover-Dempsey and Sandler's (1997) model about parental involvement (Walker et al., 2005) and Jeynes's findings, the present study examined the effects of a number of parental involvement activities, including parental participation in school events and contact with school personnel, home supervision, parent–child communication, educational aspiration, and grades expectations on their children's academic achievement. In this sample involving mothers diagnosed with chronic illnesses, only parental academic aspiration and grade expectations were associated with their children's grades. The results of the present study were consistent with the findings of Fan and Chen's (2001) meta-analytic study in which parental aspiration/expectations for children's educational achievement was identified as the form of parental involvement that was particularly highly associated with students' academic achievement.

Overall, the results of this study provide a hopeful perspective for families with parental chronic illness. Although disruptions of parenting are likely to occur in the event of parental illness as the urgency of self-care demands due to life-threatening and debilitating medical conditions may require parents living with chronic illness to give priority to their own requirements over the needs of their children, resulting in less psychological availability for or awareness of involvement activities (Armistead et al., 1995), our results suggest that mothers with physical illness could still be involved in their children's education and have a positive impact on their children's academic achievement. While parents living with chronic illness may not able to participate in certain forms (e.g., attending school meetings, helping children with homework, etc.) of parental involvement because of illness demands, physical impairment, and time required to manage their own medical-related activities, their attitudes toward their children's academic achievement (e.g., academic aspiration and expectations) may play a particularly important role in their children's academic functioning. Moreover, the results of the present study suggest that certain types of parental involvement in education may attenuate the potential impact of parental chronic illness on their children's educational functioning; specifically parents' academic efficacy played an important role in mediating the effects of their illness on their children's academic achievement.

Based on the results of the study, educational intervention and/or school–family partnership may be considered for school-aged children whose parents are diagnosed with chronic illness and experiencing significantly high demands of illness as a family. A comprehensive family functioning assessment may be conducted to determine the levels of family adjustment and identify strengths (e.g., social supports, parent–child relationships) and weaknesses (e.g., marital conflict, financial hardship) of the family that experiences parental chronic illness. The results of a family functioning assessment may also help to identify children of parents with chronic illness who are actually at academic risk and require intervention. The interventions for families with parental chronic illness should address the importance of parental attitudes and beliefs in their children's education, such as parental self-efficacy. According to Bandura (1997), parental self-efficacy is likely to be influenced by personal experiences of success in parental involvement, vicarious experience of similar others' successful involvement experiences, and verbal persuasion by others. Therefore, interventions for families with parental chronic illness are recommended to emphasize enhancing the parents' beliefs in their ability to help their children succeed in school in spite of their illness through education and positive feedback by incorporating the aforementioned four components of efficacy. Parental empowerment programs may be implemented to motivate mothers with chronic illness to get involved in their children's education. Educational information regarding the positive effects of parental involvement should be provided to the mothers with a chronic illness. In addition, alternative forms (e.g., attending school meeting through video conferencing) of academic involvement may be discussed with the mothers with chronic illness to accommodate their medical conditions. Modeling of effective parenting skills and positive parental involvement for ill mothers may be needed. Therefore, regular feedback regarding the parents' parenting practices and their effects on children's performance should be included in the parental empowerment program to promote self-monitoring skills and enhance parental self-efficacy.

Although the present study suggests that children's academic functioning may be at risk, especially when their ill parents experience significant demands imposed by their illness, no conclusive claims can be made regarding the impact of parental illness on children's educational outcomes because of lack of a control group for comparison. As a result, the present study was unable to answer whether parental illness has a definite, negative effect on children's academic performance. Moreover, the present study employed a correlational research design to examine the relationships among variables in question. As a result, no causal effect statements regarding the effects of parental illness demands on parental involvement and on their child's academic functioning can be made. For instance, an alternative explanation for our academically high performing sample might be that some children of chronically ill mothers might actually benefit from the hardship experienced by their family as their parents may compensate for their situation by focusing more on their children's educational progress, limiting their engaging in competing activities, and seeking more social and institutional supports for their children. Even though parental involvement variables, such as parental self-efficacy, educational aspirations, and grade expectations were found highly related to children's grades, we are unable to determine whether parent involvement actually affects their child's academic functioning; the results may also possibly reflect that the child's levels of academic performance set their chronically ill mother's levels of educational aspirations and expectations for him or her, as well as the levels of parental belief in their ability to help their child succeed in school.

Other limitations of this study include the use of parental rating of youth grades, which might only capture a narrow scope of children's academic functioning. In addition, parental self-report of their child's grades might be the perception of the child's performance rather than the reality. Participants data regarding family constellation, relationships among family members, and supports the family receives were not collected in this present study; therefore, their effects on levels of parental involvement and children's educational achievement remain unknown. Since the majority of the participants in the sample of this present study were White mothers diagnosed with multiple sclerosis, the generalizability of the results derived from this study may be limited. Moreover, the sample in this study constituted of a heterogeneous group that included mothers who were diagnosed with a variety of illnesses with onset of 1 to 40 years, and who had children ranging from pre- to late adolescence. As a result, the effects of maternal illness characteristics (e.g., type of illness, onset of illness, phase of illness) on parental involvement and children's academic functioning are unknown. The next step in this research will be to examine the parental involvement from the children's perspective and the effects of different types of illness and other illness characteristics (e.g., onset of illness, stages of illness, etc.) on parental involvement and children's educational outcomes in various domains. Furthermore, the effects of family characteristics (e.g., family constellation, involvement of non-ill parent, supports from siblings) on children of chronically ill mothers in the area of academic functioning will need to be systematically studied.

The present study contributes to the literature in four ways. First, our study adds important new knowledge, as the outcome measure of academic functioning in relation to parental chronic illness has scarcely been studied. Second, we suggest that high levels of parental illness demands on family functioning might place children's academic functioning at slightly increased risk. Third, parental academic self-efficacy in helping their children perform well in school may play an important role in attenuating the effects of disruption in normal family functioning as a result of parental chronic illness on children's educational achievement. Last, we recognize the resilience of children and families living with parental chronic illness. Similar to evidence found in the general population, the involvement of parents with chronic illness in their children's education is linked to children's academic performance in school. Even though parents with chronic illness may not be able to physically participate in some forms of their children's educational activities (e.g., attending school meetings, helping children with homework) because of illness demands, we suggest that parents with chronic illness may be involved in their children's educational progress by holding positive attitudes toward children's academic achievement (e.g., high educational aspirations and expectations) and engaging in alternative forms of parental involvement (e.g., contact teachers via e-mail).

Appendix

Scoring Scheme for the Measure of Grade Expectations

	Response						
	Extremely Upset	Very Upset	Slightly Upset	Neither Happy Nor Upset	Slightly Happy	Very Happy	Extremely Happy
Grade	1	2	3	4	5	6	7
A	6	5	4	3	2	1	0
B	5	4	3	2	1	0	−1
C	4	3	2	1	0	−1	−2
D	3	2	1	0	−1	−2	−3
F	2	1	0	−1	−2	−3	−4

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References

Anderson, C. A., & Hammern, C. L. (1993). Psychosocial outcomes of children of unipolar depressed, bipolar, medically ill, and normal women: A longitudinal study. *Journal of Consulting and Clinical Psychology, 61*, 448-454. doi:10.1037/0022-006X.61.3.448

Armistead, L., Klein, K., & Forehand, R. (1995). Parental physical illness and child functioning. *Clinical Psychology Review, 15*, 409-422. doi:10.1016/0272-7358(95)00023-I

Ballantine, J. H. (1999). Getting involved in our children's education. *Childhood Education, 75*, 170-171.

Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York, NY: Freeman.

Bandura A., Barbaranelli, C., Caprara, G. V., & Pastorelli, C. (1996). Multifaceted impact of self-efficacy beliefs on academic functioning. *Child Development, 67*, 1206-1222. doi:10.2307/1131888

Baron, R., & Kenny, D. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*, 1173-1182. doi:10.1037/0022-3514.51.6.1173

Cohen, J. (1992). A power primer. *Psychological Bulletin, 112*, 155-159. doi:10.1037/0033-29 09.112.1.155

Cooper, C. E., & Crosnoe, R. (2007). The engagement in schooling of economically disadvantaged parent and children. *Youth & Society, 38*, 372-391. doi:10.1177/004411 8X06289999

De Judicibus, M. A., & McCabe, M. P. (2006). The impact of parental multiple sclerosis on the adjustment of children and adolescents. *Family Therapy, 33*, 79-97.

Dura, J., & Beck, S. J. (1988). A comparison of family functioning when mothers have chronic pain. *Pain, 35*, 79-89. doi:10.1016/0304-3959(88)90279-5

Fan, X. (2001). Parental involvement and students' academic achievement: A growth modeling analysis. *Journal of Experimental Education, 70*, 27-61. doi:10.1080/002209701095 99497

Fan, X., & Chen, M. (2001). Parental involvement and students' academic achievement: A meta-analysis. *Educational Psychology Review, 13*, 1-22. doi:10.1023/A:1009048817385

Fehrmann, P. G., Keith, T. Z., & Reimers, T. M. (1987). Home influence on school learning: Direct and indirect effects of parental involvement on high school grades. *Journal of Educational Research, 80*, 330-337.

Gonzalez-DeHass, A. R., Willems, P. P., & Holbein, M. F. D. (2005). Examining the relationship between parental involvement and student motivation. *Educational Psychology Review, 17*, 99-123. doi:10.1007/s10648-005-3949-7

Grabiak, B. R., Bender, C. M., & Puskar, K. R. (2007). The impact of parental cancer on the adolescent: An analysis of the literature. *Psycho-Oncology, 16*, 127-137. doi:10.1002/pon.1083

Green, C. L., Walker, J. M. T., Hoover-Dempsey, K. V., & Sandler, H. M. (2007). Parents' motivations for involvement in children's education: An empirical test of a theoretical model of parental involvement. *Journal of Educational Psychology, 99*, 532-544. doi:10.1037/0022-0663.99.3.532

Haberman, M. R., Woods, N. F., & Packard, N. J. (1990). Demands of chronic illness reliability and validity assessment of a demands of illness inventory. *Holistic Nursing Practice, 5*, 25-35.

Hirsch, B. J., Moos, R. H., & Reischl, T. M. (1985). Psychosocial adjustment of adolescent children of a depressed, arthritic, or normal parent. *Journal of Abnormal Psychology, 94*, 154-164. doi:10.1037/0021-843X.94.2.154

Hoke, L. A. (2001). Psychosocial adjustment in children of mothers with breast cancer. *Psycho-Oncology, 10*, 361-369. doi:10.1002/pon.515

Hong, S., & Ho, H. Z. (2005). Direct and indirect longitudinal effects of parental involvement on student achievement: Second-order latent growth modeling across ethnic groups. *Journal of Educational Psychology, 97*, 32-42. doi:10.1037/0022-0663.97.1.32

Hoover-Dempsey, K. V., Bassler, O. C., & Brissie, J. S. (1992). Explorations in parent-school relations. *Journal of Educational Research, 85*, 287-294.

Hoover-Dempsey, K. V., & Sandler, H. M. (1995). Parental involvement in children's education: Why does it make a difference? *Teachers College Record, 97*, 310-331.

Hoover-Dempsey, K. V., & Sandler, H. M. (1997). Why do parents become involved in their children's education? *Review of Educational Research, 67*, 3-42. doi:10.2307/1170618

Hough, E. E., Lewis, F. M., & Woods, N. F. (1991). Family response to mother's chronic illness: Case studies of well- and poorly-adjusted families. *Western Journal of Nursing Research, 13*, 568-596. doi:10.1177/019394599101300502

Izzo, C. V., Weissberg, R. P., Kasprow, W. J., & Fendrich, M. (1999). A longitudinal assessment of teacher perceptions of parent involvement in children's education and school performance. *American Journal of Community Psychology, 27*, 817-839. doi:10.1023/A:1022262625984

Jeynes, W. H. (2007). The relationship between parental involvement and urban secondary school student academic achievement: A meta-analysis. *Urban Education, 42*, 82-110. doi:10.1177/0042085906293818

Korneluk, Y. G., & Lee, C. M. (1998). Children's adjustment to parental physical illness. *Clinical Child and Family Psychology Review, 1*, 179-193. doi:10.1023/A:1022654831666

Lewis, F. M., & Hammond, M. A. (1996). The father's, mother's, and adolescent' functioning with breast cancer. *Family Relations, 15*, 456-465. doi:10.2307/585176

Lewis, F. M., Woods, N. F., Hough, E. E., & Bensley, L. S. (1989). The family's functioning with chronic illness in the mother: The spouse's perspective. *Social Science & Medicine, 29*, 1261-1269. doi:10.1016/0277-9536(89)90066-X

Okagaki, L., & Frensch, P. A. (1998). Parenting and children's school achievement: A multiethnic perspective. *American Educational Research Journal, 35*, 123-144. doi:10.2307/1163454

Osborn, T. (2007). The psychosocial impact of parental cancer on children and adolescents: A systematic review. *Psycho-Oncology, 16,* 101-126. doi:10.1002/pon.1113

Pedersen, S., & Revenson, T. A. (2005). Parental illness family functioning and adolescent well-being: A family ecology framework to guide research. *Journal of Family Psychology, 19*, 404-409. doi:10.1037/0893-3200.19.3.404

SAMHSA's Prevention Platform. (n.d.). *Measures and instruments resource: Parental involvement in school interview* (CSAP core measure/CMIR25). Retrieved from https://preventionplatform.samhsa.gov/macro/csap/mir_search_create/redesign/measures/detail.cfm?MeasureID=05b200f2-85b1-4e2c-8a63-bd1af2744a12&Category=&Row=&CategoryID=&CFID=68323&CFTOKEN=80168432

Shaffer, A., Jones, D. J., Kotchick, B. A., Forehand, R., & The Family Health Project Research Group. (2001). Telling the children: Disclosure of maternal HIV infection and its effects on child psychosocial adjustment. *Journal of Child and Family Studies, 10*, 301-313. doi:10.1023/A:1012502527457

Shumow, L., & Lomax, R. (2002). Parental efficacy: Predictor of parenting behavior and adolescent outcomes. *Parenting: Science and Practice, 2*, 127-150. doi:10.1207/S15327922PAR0202_03

Sobel, M. E. (1988). Direct and indirect effect in linear structural equation model. In J. S. Long (Ed.), *Common problems/proper solutions: Avoiding error in quantitative research* (pp. 46-64). Beverley Hills, CA: SAGE.

Walker, J. M. T., Wilkins, A. S., Dallaire, J. R., Sandler, H. M., & Hoover-Dempsey, K. V. (2005). Parental involvement: Model revision through scale development. *The Elementary School Journal, 106*, 85-104. doi:10.1086/499193

Watson, M., St. James-Roberts, I., Ashley, S., Tilney, C., Brougham, B., Edwards, L., . . . Romer, G. (2006). Factors associated with emotional and behavioral problems among school age children of breast cancer patients. *British Journal of Cancer, 94*, 43-50.

Welch, A. S., Wadsworth, M. E., & Compas, B. E. (1996). Adjustment of children and adolescent to parental cancer: Parents' and children's perspectives. *Cancer, 77*, 1409-1418.

Woods, N. F., Haberman, M. R., & Packard, N. J. (1993). Demands of illness and individual, dyadic, and family adaptation in chronic illness. *Western Journal of Nursing Research, 15*, 10-25. doi:10.1177/019394599301500102