Parent-child relationships and parental distress as moderators between chronic illness and psychological problems in emerging adults.

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Parent-child relationships and parental distress as moderators between chronic illness and psychological problems in emerging adults.

By

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A Thesis
Submitted to the Faculty of
Mississippi State University
in Partial Fulfillment of the Requirements
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in Psychology
in the Department of Psychology

Mississippi State, Mississippi

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The current study aimed to better understand how parental functioning and parent-child relationships might moderate the effects of chronic illness on psychological problems in emerging adulthood. Three hypotheses were made: (1) the presence and severity of chronic illness would associate positively with emerging adult psychological problems, (2) parental distress would moderate the effects between chronic illness presence/severity and emerging adulthood psychological problems, and (3) parent-child relationship quality would moderate the effects between chronic illness presence/severity and emerging adult psychological problems. Data analysis consisted of testing interaction effects, pairwise parameter comparisons, and multiple group analysis. The three-way interaction between endorsing a health condition, physical quality of life, and maternal psychological distress significantly predicted psychological problems in both emerging adult men and women. Additionally, the three-way interaction between endorsing a health condition, physical quality of life, and maternal parent-child relationship quality significantly predicted psychological problems in both emerging adult men and women.
DEDICATION

This body of work is dedicated to Corey, my life partner. I am forever grateful for your endless support, inspiration, and confidence that is consistent throughout my endeavors in graduate school and in life. This work is also dedicated to my family who taught me the value of hard work and whose contributions have been undeniably crucial to my successes.
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Background

As defined by the Centers for Disease Control and Prevention (CDC, 2021), a chronic illness/disease is a medical condition that persists for over 1 year, interferes with daily living, and requires ongoing medical treatment. The prevalence of chronic illnesses in children is increasing with more than 25% of children and adolescents suffering from at least one condition (Compas et al., 2012). For the purposes of the current study, psychological diagnoses will not be considered as chronic illnesses. Moss-Morris (2013) introduced a unified theory and a working model of adjustment to chronic illness (see Figure 1). This theory suggests that when an individual is diagnosed with a chronic illness, their current emotional equilibrium and quality of life are disrupted. This disruption in equilibrium can lead to either good or poor physical, psychological, and social adjustment depending on personal (e.g., personality traits, life experiences), social (e.g. social support), and environmental (e.g. access to health care) background factors. Individuals respond and adapt to their illness stressors according to these background factor influences. In accordance with self-regulation theory (Leventhal et al., 1998), adjusting to a chronic illness is the process that allows an individual to return to equilibrium.

Another factor that has been shown to disrupt equilibrium and quality of life is transitioning into emerging adulthood. Specifically, the Life Course Health Development model (Wood et al., 2018) identifies emerging adulthood as a pivotal transitioning period that may
influence the developmental pathway of an individual. It is during this stage in which individuals’ personal, social, emotional, neuroanatomical, and developmental levels experience the most complex and dynamic changes. Chronic health conditions in emerging adults may reduce the likelihood of undertaking adult roles, impair academic success, inhibit work, and increase the difficulty of independent living (Wood et al., 2018). For these reasons as well as the relative lack of research on how chronic illnesses affect emerging adults compared to younger age groups, the current study analyzed a sample of emerging adults.

**Effects of Chronic Illness on Children and Adults**

A plethora of effects are associated with pediatric chronic illness for both children and adults experiencing the disease. Psychopathology has been shown to be very prevalent in 8–12-year-old children with a chronic illness, as reported by child and parent on the Childhood Psychopathology Measurement schedule (CPMS), with depression being the most elevated subscale followed in descending order by anxiety, behavior problems, special symptoms, conduct problems, and somatization (Pradhan et al., 2003). In a meta-analysis analyzing data from 33,047 children and adolescents with an average age of 12.6 years, Pinquart and Shen (2011) also demonstrated that chronically ill children and adolescents experienced higher levels of depressive symptoms in comparison to their healthy peers, as reported by the child, with an effect size of .19. Both girls and boys with chronic illnesses aged 7-9 years were more likely to experience emotional problems (Hysing et al., 2007); in addition, children with chronic illness aged 4-17 were more likely than their healthy peers to demonstrate internalizing problems, specifically depression and social withdrawal (Boekaerts & Röder, 1999). In children with an average age of 11.6 who had inflammatory bowel disease, nearly three-quarters had been diagnosed with a psychiatric disorder including separation anxiety, major depressive disorder,
phobias, obsessive compulsive disorder, overanxious disorder, and panic disorder; one-fifth of these children experienced suicidal ideation (Szajnberg et al., 1993).

Emerging adults who had a chronic illness that was diagnosed during childhood were less likely than their healthy peers to reach milestones such as graduating from high school, finishing advanced education, securing a job, living independently, marrying, and having children and they experienced more difficulties when they did reach such milestones (Maslow, 2011; Pinquart, 2014). Additionally, emerging adults with pediatric chronic illnesses have reported experiencing personal and social challenges; for example, these individuals avoided selected activities and public spaces (Snelgrove et al., 2016). College students suffering from a chronic illness have reported experiencing illness-related shame (e.g., feeling ashamed to discuss the illness and associated symptoms with others), which has been associated negatively with social relationship quality and psychological health as measured by the World Health Organization Brief Quality of Life Assessment Scale (WHOQOL-BREF) (Trindade et al., 2018). However, it appears that the literature regarding the psychological effects of having a pediatric chronic illness as presented in emerging adults is lacking relative to children and adolescents.

Effects of Pediatric Chronic Illness on Parental Caregivers

When a family member has a chronic illness, the psychological well-being of the family members is at risk to the point that it may impair individuals’ ability to care for family members with an illness (Holmes & Deb, 2003). Parental caregivers of children with chronic illnesses have been found to experience heightened levels of stress, which in turn was associated positively with the child’s severity of symptoms (Waters et al., 2017); specifically, parents of chronically ill children have been found to report higher Parenting Stress Index health problem scores in comparison to parents of healthy children (Miodrag et al., 2014).
Parents of a child with chronic illness tended to have high psychopathology, as measured by the Symptom Checklist 90 R (SCL-90-R), with the five most elevated subscales in descending order being depression, somatization, obsessive-compulsive, anxiety, and anger hostility (Rao et al., 2004). Meta-analyses conducted by Pinquart (2017, 2019a) found that when compared to their children with illness, parents had significantly higher levels of anxiety and depression and had clinically high levels of depression. In a study conducted by van Oers et al. (2014), 31.8% of mothers and 20.3% of fathers of a chronically ill child demonstrated clinically significant anxiety levels as well as significantly higher levels of anxiety in comparison to the reference group (mothers: $d = 31$; fathers: $d = .19$). Additionally, 23% of mothers and 19.5% of fathers showed clinically significant depression levels as well as significantly higher levels of depression in comparison to the reference group (mothers: $d = .42$; fathers: $d = .25$). Parents also have shown strong elevations of Post-Traumatic Stress Symptoms with 19% of parents meeting PTSD diagnostic criteria (Pinquart, 2019b). A longitudinal study conducted by Muscara et al. (2018) classified 159 parents according to Post-Traumatic Stress Symptoms with 33% being classified as resilient (parents showed low distress across the course of the trajectory), 52% as recovery (parents showed significantly high levels of distress at the first time period and a gradual decrease of distress across the next three time points), and 13% as chronic (parents showed significantly high levels of distress consistently across all time periods). Moreover, having a chronic illness may cause economic and financial distress on a family; economic distress has been found to directly increase the likelihood of emotional distress as well as decrease the ability to cope with psychological distress (Holmes & Deb, 2003).
Effects of Pediatric Chronic Illness on Parent-Child Relationships

Pinquart (2013) conducted a meta-analysis to compare parent-child relationships, parenting behaviors, and styles of families who had a child with a chronic physical illness (with a mean age of 10.38 years) with families who had children who were healthy. Analyses were conducted using 325 studies which included 31,288 children with chronic illness with ratings completed by parents, child, or an observer. Results showed that, on average, parent-child relationship quality was less positive in children with a chronic illness ($g = -.16$). Additionally, parents of a child with a chronic illness displayed less warmth ($g = -.22$), more controlling behaviors ($g = .18$), and higher levels of overprotection ($g = .39$) when compared to parents of healthy children. In terms of parenting styles, parents who had a child with a chronic illness were more likely to display neglectful ($g = .51$) and authoritarian parenting ($g = .24$). When compared to parents of healthy children, parents of a child with epilepsy, hearing impairment, or asthma showed significantly lower levels of responsiveness and higher levels of demandingness. In children with inflammatory bowel disease, 86.67% of the mother-child relationships were rated as insecurely attached while 46.67% of these mothers were dismissive/detached and 33.33% were angrily enmeshed (Szajnberg et al., 1993). It appears that parent-child relationships have yet to be studied in emerging adults with chronic illnesses despite the theoretical importance of doing so when considering the effects that parent-child relationships and chronic illnesses have on emerging adults.

Effects of Parent-Child Relationships on Emerging Adults

As noted above, the emerging adulthood phase is a vital period for successful transitioning into adulthood. During this time, an individual’s social sphere is reentered with peer relationships becoming more central and parent-child relationships becoming more peripheral.
(Tanner, 2006). However, regardless of a decrease in communication, the quality of parent-child relationships tends to significantly improve during emerging adulthood (Lindell & Campione-Barr, 2017). Emerging adults with increased parent-child relationship quality were more likely to have well-adjusted qualities that have been identified as important for succeeding in adulthood (Nelson & Padilla-Walker, 2013). A 3-year longitudinal study of college students’ transition, conducted by Lindell et al. (2017), demonstrated that, generally, increased parent-child relationship quality led to feeling like an adult. Additionally, emerging adults’ adult status, feelings of competence, and vocational identity achievement are all negatively impacted by increased levels of parental control. Thus, research supports the claim that parent-child relationship quality has long-term implications for emerging adults.

**The Current Study**

Using the working model of adjustment to chronic illness (Moss-Morris, 2013), the current study aimed to identify potential background factors that may contribute to good or poor adjustment in emerging adults with a health condition; specifically, parent-child relationship quality and parental distress were tested as adjustment factors according to the model. Previous research has shown the effects of chronic illness on individuals with a condition, parental caregivers, and parent-child relationship quality. However, it appears no study has examined these variables in combination or as variables affecting outcomes in emerging adults with a health condition. Moreover, information about the effects of chronic illness on emerging adults is lacking relative to younger age groups. Thus, the current study aimed to better understand how theoretically relevant factors (i.e., parental psychological functioning and parent-child relationships) might moderate the effects of having a health condition on psychological problems in emerging adulthood. Specifically, parent-child relationship quality and parental distress were
tested as moderating variables between having a health condition and psychological problems in emerging adulthood. Previous research also has tended to focus on maternal factors rather than paternal ones, whereas the current study explored both maternal and paternal influences. Finally, these effects were examined across emerging adult sex. That is, the moderating effects of parental distress and parent-child relationship quality were investigated across parent-child dyads (i.e., mother-daughter, mother-son, father-daughter, and father-son) given research demonstrating mixed findings regarding parenting and sex.

Hypothesis 1 stated that the presence and severity (as measured by physical quality of life) of health condition would associate positively with emerging adult psychological problems. Hypothesis 2 stated that parental distress would moderate the effects health condition presence/severity and emerging adulthood psychological problems, such that high parental distress would worsen the influence of health condition on emerging adulthood psychological problems. Hypothesis 3 stated that parent-child relationship quality would moderate the effects between health condition presence/severity and emerging adult psychological problems, such that lower parent-child relationship quality would worsen the effects of health condition on psychological problems. Hypotheses regarding sex dyads were not made based on conflicting research. For example, social cognitive theory (Bussey & Bandura, 1999) suggests that same-sex dyads would demonstrate stronger effects given that models with similar characteristics are more influential. Conversely, gender role theory (Bem, 1974) suggests that mothers, compared to fathers, may provide more relational support, which may be critical when dealing with a health condition. Moreover, this theory suggests that women may receive more relational support than men.
CHAPTER II
METHODS

Participants and Procedure

A power analysis using 29 predictors (i.e., seven main effects, 15 two-way effects, four three-way effects, and three covariates [i.e., race and maternal and paternal education] was conducted assuming a power of .80 and an alpha of .01. The required sample sizes to detect a small (.02), medium (.15), and large (.35) effect were 1641, 241, and 119, respectively.

The final set of participants consisted of 538 college-attending emerging adults, aged 18-25, who were recruited from an online participant pool in a psychological research program at a large Southern United States university. As shown in Table 1, the majority of participants were White, female, emerging adults who were raised in a two biological and educated parental household. All study procedures were approved by the authors’ institutional review board and were carried out in accordance with the APA Code of Ethics. Interested participants could view a description of the study online. Upon choosing to participate, an informed consent form was presented to participants. After indicating informed consent, participants completed measures in random order, maternal and paternal forms separately, and with respect to current perceptions. Participants were given a printable debriefing form and research credit upon their completion of or voluntary withdrawal from the study.
Measures

Health Condition

Participants were asked to “indicate if you have ever experienced (or still experience) any of the following MEDICAL conditions for at least 1 year.” The participant reported their specific diagnosis by selecting all diagnosed illnesses from a list of 42 health conditions or by entering a non-listed condition. Participants were also asked to indicate if they have not experienced any of the listed or related conditions. Participants who reported one or more health condition were asked to report age of onset and duration. This method of measuring chronic illnesses/health conditions has been endorsed by several studies (Herts et al., 2014; Ingram & South, 2020; Lum et al., 2019a; Lum et al., 2019b).

The World Health Organization Quality of Life – Brief

Emerging adult quality of life was measured using the World Health Organization Quality of Life – Brief (WHOQOL-BREF), which has shown good internal reliability with Cronbach’s alphas between .65 and .93 as well as good criterion validity (The WHOQOL Group, 1998). This 26-item measure analyzes four domains of quality of life: physical health (e.g., dependence on medicinal substances and medical aids), psychological (e.g., negative and positive feelings), social relationships (e.g., social support), and environment (e.g., financial resources). Participants answer prompts on a scale ranging from not at all to completely. The physical quality of life scale was used in combination with report of health condition as a measure of illness severity. Previous research has used both physical aspects (e.g., pain) and psychological aspects (e.g., depressed mood) of quality of life to measure symptom severity of chronic illnesses (Horwood et al., 2016).
Parent-child relationship quality was measured using the Parental Environment Questionnaire (PEQ), which is a 42-item measure that analyzes parent-child relationships as perceived by the child; previous research has used this measure in samples of emerging adults (Rogers & McKinney, 2019; Walkner & Rueter, 2014). The measure includes five subscales: conflict (e.g., *My mother/father hits me in anger*), parental involvement (e.g., *My mother/father doesn’t know about my hobbies*), regard for parent (e.g., *I don’t want my friends to meet my mother/father*), regard for child (e.g. *My mother/father praises me when I do well*), and structure (e.g., *My mother/father makes it clear what s/he wants me to do or not to do*). Participants answered prompts on a scale ranging from *definitely true* to *definitely false*. Elkins et al. (1997) tested the reliability and validity of the PEQ; these analyses demonstrated good internal reliability with correlations ranging from .46 to .86 as well as good interrater reliability with correlations ranging from .79 to .92. Additionally, Elkins et al. (1997) demonstrated construct validity by correlating the PEQ scales with similar relationship dimensions.

Parent-child relationship quality was determined by loading the maternal and paternal subscale scores onto a maternal and paternal latent variable, respectively. Observed variables included the subscales of the maternal and paternal PEQ (i.e., conflict, regard for child, regard for parent, involvement, and structure), loaded onto their respective maternal and paternal latent variables. This model fit the data poorly ($\chi^2(87) = 470.98, p < .001$, $\text{CFI} = .89$, $\text{SRMR} = .08$, $\text{RMSEA} = .09$); structure was removed due to having a low factor loading (< .60), which resulted in acceptable model fit ($\chi^2(59) = 229.63$, $\text{CFI} = .94$, $\text{SRMR} = .07$, $\text{RMSEA} = .07$; Hu & Bentler, 1999). This model was tested for invariance testing across sex. Metric and scalar invariance were
demonstrated according to cutoffs by Putnick and Bornstein (2016; i.e., ΔCFI < .02 and ΔRMSEA < .03; see Table 2). Factor loadings of the model are presented in Table 3.

**The Adult Self-Report**

To assess psychological problems in emerging adults, the Adult Self-Report (ASR) was used (Achenbach & Rescorla, 2003). The ASR is a 123-item self-report scale that measures adaptive functioning (e.g., *I make good use of my opportunities*), syndromes (e.g., *anxiety, depression, withdrawal, somatic complaints, rule-breaking behavior, aggressive behavior*), and internalizing, externalizing, and total problems. Participants answer items on a 3-point Likert-type scale ranging from 0 (*not true*) to 2 (*very true or often true*). The ASR demonstrated Cronbach’s alphas between .51 and .93, test-retest reliability correlations ranging from .77 to .99, and interrater reliability correlations ranging from .30 to .79 according to Achenbach and Rescorla (2003). Convergent validity was established by correlating the ASR subscales to the related Symptom Checklist-90 subscales which demonstrated correlations between .35 to .78. The total problems score, which consists of all the problems items summed, was used to represent psychological problems.

**The Adult Behavior Checklist**

To measure parental distress, the Adult Behavior Checklist (ABCL) was used. The scale was developed by Achenbach and Rescorla (2003), is a parallel form of the ASR (i.e., has the same number of items and subscales), and has shown good psychometrics if the informant is familiar with the person being rated (e.g., an emerging adult reporting on their parent). The ABCL has demonstrated Cronbach’s alphas ranging from .67 to .97 as well as test-retest correlations ranging from .73 to .94. Consistent with past research (e.g., Barry et al., 2005;
McClelland & McKinney, 2016), the internalizing problems scale was used as a measure of perceived parental distress.

**Data Cleaning**

Before data cleaning, $N = 761$. Listwise deletion was conducted so that all models would examine individuals who reported on both a mother and a father figure. Missing data for endorsing a health condition ($n = 103$) were handled with listwise deletion given that it is an instrumental variable in the study. Remaining missing data for the PEQ and ABCL (0.08%) were accounted for by running a multiple imputation; such a low rate of missingness is unlikely to affect analyses (Bennett, 2001; Schafer, 1999). After accounting for missing data, $N = 538$. Data were found to be within normal limits regarding skew and kurtosis (Kline, 2016).

**Data Analysis**

Descriptive statistics were conducted using SPSS 28.0. Modeling analyses were conducted using AMOS 28.0. Variables in the model included presence of health condition, physical quality of life as measured by the WHOQOL-BREF, perceived maternal and paternal distress as measured by the internalizing problems scale of the ABCL, perceived maternal and paternal relationship quality as measured by the PEQ (derived from latent variables indicated by the five subscales of the PEQ as described above), and emerging adult psychological problems as measured by the total problems scale of the ASR.

See Figure 2 for conceptual models of the analyses. Running a single model with all interaction terms resulted in more parameters than could be processed by AMOS. To run analyses, the original model was split into two models: one for parental psychological problems and one for parent-child relationship quality. To best capture the presence and severity of health
condition, an interaction term of presence of health condition and physical quality of life was created (i.e., two-way interaction) for both models. This interaction term was further moderated by maternal and paternal distress in the parental psychological distress model (i.e., two three-way interactions) and by maternal and paternal relationship quality in the parental relationship quality model (i.e., two three-way interactions). In both models, these three-way interactions were examined across participant sex using multiple group analysis and pairwise parameter comparisons. All two-way interactions in both models also were included but no hypotheses were made about them. See Table 4 for all main and interaction effects modeled. Significant hypothesized interactions were plotted with spotlight analysis at +/- 1 SD.

Hypothesis 1 was tested by examining the two-way interaction effect of health condition * severity (as measured by physical quality of life) on emerging adult psychological problems. Hypothesis 2 was tested by examining the three-way interaction effect of health condition * severity * paternal distress and health condition * severity * maternal distress. Hypothesis 3 was tested in the same manner as Hypothesis 2, replacing distress with relationship quality. Exploratory parent sex analyses were tested using pairwise parameter comparisons, which produce Z scores comparing the statistical difference between paths (i.e., hypothesized maternal and paternal interaction effects were statistically compared). Additionally, emerging adult sex was tested using multiple group analysis (i.e., paths were modeled for females and males) and pairwise parameter comparisons (i.e., female and male paths regarding hypothesized interactions were statistically compared).
CHAPTER III
RESULTS

Preliminary Analyses

Of the 538 participants, 205 (38.10%) reported having a lifetime history of a health condition. See Table 5 for the frequencies of all reported health conditions. Of these individuals, 187 (91.22%) reported that the health condition was developed under the age of 18. The mean age of onset for health conditions was 11.77 years old while the mode was 16 years old (34 individuals). Additionally, 137 (66.83%) reported that they were still living with their health condition.

As shown in Table 6, women reported significantly higher perceived maternal distress than men, whereas no significant sex differences were found on other variables. As shown in Table 7, emerging adult psychological problems were significantly related to all other variables across sex in expected directions.

Hypothesis 1

In the parental psychological distress model as shown in Table 4, endorsing a health condition was found to significantly predict psychological problems in emerging adulthood in both the men and women. However, the interaction between endorsing a health condition and physical quality of life was not found to significantly predict psychological problems in emerging adult men or women, failing to support the hypothesis.
In the parent-child relationship quality model, endorsing a health condition was found to significantly predict psychological problems in emerging adulthood in men but not in women. The interaction between endorsing a health condition and physical quality of life did not significantly predict psychological problems in emerging adult men or women, failing to support the hypothesis.

**Hypothesis 2**

In the parental psychological distress model, the three-way interaction between endorsing a health condition, physical quality of life, and maternal psychological distress was found to significantly predict psychological problems in both emerging adult men and women, supporting the hypothesis. The three-way interaction between endorsing a health condition, physical quality of life, and paternal psychological distress did not significantly predict psychological problems in emerging adult men or women, failing to support the hypothesis.

See Figure 3 for a plot of the significant 3-way interaction with maternal distress in women and men. Based on that plot, in emerging adult men who reported having a health condition and low physical quality of life, high maternal psychological distress – in comparison to low maternal distress – was associated with higher psychological problems, supporting the hypothesis. That is, maternal psychological distress exacerbated having a health condition and low quality of life; indeed, this hypothesized group reported the most psychological problems. Additional notable findings related to Figure 3 were identified. Reporting a mother with high distress was associated with higher psychological problems across all levels of other variables in men (i.e., consistent main effect of maternal distress). Having a health condition was associated with higher psychological problems in emerging adult men who reported low maternal psychological distress and low physical quality of life as well as men who reported high maternal
distress and high physical quality of life. The men who reported the least psychological problems also reported having a health condition but high physical quality of life and low maternal psychological distress.

Furthermore, in emerging adult women who reported having a health condition and low physical quality of life, high maternal psychological distress – in comparison to low maternal distress – was associated with higher psychological problems, supporting the hypothesis and consistent with the finding in men. Additionally, reporting a mother with high distress was associated with higher psychological problems across all levels of other variables in women (i.e., consistent main effect of maternal distress). Having a health condition was associated with higher psychological problems in emerging adult women who reported low maternal psychological distress and low physical quality of life as well as in women who reported high maternal psychological distress and high physical quality of life. The emerging adult women who reported the most psychological problems also reported high maternal psychological distress and low physical quality of life; however, having a health condition did not associate with psychological problems in these conditions. Emerging adult women who reported the least psychological problems also reported endorsing a health condition, a high physical quality of life, and low maternal psychological distress.

**Hypothesis 3**

In the parent-child relationship model, the three-way interaction between endorsing a health condition, physical quality of life, and maternal parent-child relationship quality was found to significantly predict psychological problems in both emerging adult men and women, supporting the hypothesis. The three-way interaction between endorsing a health condition, physical quality of life, and paternal parent-child relationship did not significantly predict
psychological problems in either emerging adult men or women, failing to support the hypothesis.

See Figure 4 for a plot of the significant 3-way interaction with maternal relationship quality in women and men. Based on that plot, in emerging adult men who reported having a health condition and low physical quality of life, also reporting low maternal relationship quality – in comparison to high maternal relationship quality – was associated with higher psychological problems, supporting the hypothesis (i.e., lower relationship quality exacerbated having a health condition and low physical quality of life). Again, this hypothesized group had the highest psychological problems. Having low maternal relationship quality was associated with much higher psychological problems across all levels of variables in men except in men who reported no health condition and low physical quality of life. Having a health condition was associated with higher psychological problems in men who reported low or high maternal relationship quality and high physical quality of life. Men who reported the least psychological problems also reported no health condition, high physical quality of life, and high maternal relationship quality.

Furthermore, when examining emerging adult women who reported having a health condition and low physical quality of life, those who also reported low maternal relationship quality – in comparison to high maternal relationship quality – reported higher psychological problems, supporting the hypothesis. Again, this hypothesized group reported the most psychological problems. Reporting low maternal relationship quality was associated with higher psychological problems across all levels of variables in all women except those who reported having a health condition and low physical quality of life. In emerging adult women, having a health condition was associated with higher psychological problems when high maternal relationship quality and high physical quality of life were reported. In women who reported high
maternal relationship quality and low physical quality of life, having a health condition had no association with psychological problems. Women who reported the least psychological problems also reported no health condition, high physical quality of life, and high maternal relationship quality.
CHAPTER IV
DISCUSSION

The aim of the current study was to better understand if parental distress and parent-child relationship quality moderate the effects of having a health condition on psychological problems reported by emerging adults. Results demonstrated that maternal distress and maternal parent-child relationship quality significantly moderated the effects of having a health condition on emerging adult psychological problems, such that as perceptions of maternal distress were higher or maternal parent-child relationship quality was lower, the positive association between severity of having a health condition and emerging adult psychological problems rose.

Hypothesis 1

Hypothesis 1 stated that the presence and severity (as measured by physical quality of life) of a health condition would positively associate with psychological problems in emerging adulthood. Results demonstrated that endorsing a health condition significantly associated with psychological problems in emerging adult men and women in the parental distress model and in emerging adult men in the parent-child relationship model. This finding supports previous research that has shown that having a chronic illness increases psychological problems in children, adolescents, and emerging adults (Pinquart & Shen, 2011; Pradhan et al., 2003; Trindade et al., 2018). However, in both models, the interaction between having a health condition and physical quality of life did not predict psychological problems in emerging adults. This may be due to the fact that physical quality of life is not an exact measure of illness severity.
and is not the only facet in which severity of illness presents itself. For instance, severity of
illness may also be expressed through frequency, price, and/or type of treatment/medication as
well as need to routine medical visits or procedures. The lack of significant findings may also be
due to the nature of the sample. For example, all participants were college-attending individuals;
therefore, it is plausible that all participants have a physical quality of life that does not
completely prevent them from meeting the demands of college, such as attending class and
traveling across campus.

**Hypothesis 2**

Hypothesis 2 stated that parental distress would moderate the effects of having a health
condition on emerging adulthood psychological problems, such that as parental distress
increases, the influence of the health condition on emerging adulthood psychological problems
would worsen. Results demonstrated that psychological problems in emerging adult men and
women were predicted by the three-way interaction between maternal psychological distress,
health condition, and physical quality of life, contributing novel findings to the field. However,
this effect did not occur when examining paternal variables. The lack of significant effects for
paternal psychological distress may suggest that maternal factors are more influential over
psychological outcomes in emerging adults with health conditions. Gender role theory (Bem,
1974) suggests that care taking is a maternal role. Additionally, several studies have supported
the idea that mothers take on the brunt of childcare in children who are chronically ill (Bristol et
al., 1988; Gavin & Wysocki, 2006; Quittner et al., 1998). Therefore, there may be a greater cost
to an individual with a health condition if their mother, rather than their father, is experiencing
psychological distress.
Furthermore, the emerging adult men who reported the most psychological problems also reported having a health condition, low physical quality of life, and high maternal distress, highlighting that the combination of all these variables predicted the highest likelihood of psychological problems. Emerging adult women who reported the most psychological problems also reported high maternal psychological distress and low physical quality of life but scores on psychological problems did not differ based on if the women had a health condition or not. This finding may suggest that across sex, low physical quality of life and high maternal psychological distress are the most psychologically impairing variables. Additionally, this finding may suggest that the most psychologically detrimental facet of having a health condition is the impact that it has on physical quality of life; specifically, in men and women who reported high maternal psychological distress and high physical quality of life, having a health condition did associate with psychological problems, but the scores were significantly lower than those with low physical quality of life and high maternal psychological distress.

When maternal psychological distress was low, having a health condition significantly associated with psychological problems in both men and women with low physical quality of life, but not when physical quality of life was high. It is possible that low maternal psychological distress is a strong protective factor over having a health condition when the individual also has a high physical quality of life. There was a main effect of maternal psychological distress across all combinations of variables across sex, such that higher maternal distress associated with higher psychological problems in emerging adults, supporting previous research that having a parent with mental health problems increases psychological problems in offspring of all ages (Hammen et al., 2004; Lewandowski et al., 2014; Papp et al., 2005; Steele & McKinney, 2020).
Hypothesis 3

Hypothesis 3 stated that parent-child relationship quality would moderate the effects between health condition presence/severity and psychological problems in emerging adulthood, such that lower parent-child relationship quality would worsen the effects of having a health condition on psychological problems in emerging adults. Results demonstrated that psychological problems in emerging adult men and women were predicted by the three-way interaction between maternal parent-child relationship quality, health condition, and physical quality of life, contributing novel findings to the field. However, this effect did not occur when examining paternal variables. Similar to parental psychological distress, the lack of significant effects of paternal relationship-quality may be explained by gender role theory (Bem, 1974) and previous research (Bristol et al., 1988; Gavin & Wysocki, 2006; Quittner et al., 1998) suggesting that since childcare is a maternal-associated role, having a poor relationship with one’s mother may be more detrimental to the individual with a health condition than a poor relationship with one’s father. An individual may have increased psychological problems if they feel as though the person who is “supposed” to be taking care of them is not fulfilling that role properly.

Additionally, previous research has demonstrated that parent-child relationships tend to be less positive in children with a health condition as the parents (specifically mothers) tend to display less warmth, more control, and overprotection (Szajnberg et al., 1993; Pinquart, 2013), all of which have been shown to worsen offspring’s psychological problems (Gere et al., 2012; Piko & Balázs, 2012; Santesteban-Echarri et al., 2017). Mullins et al. (2004) suggested that parents may be overprotective of their children with illness due to perceived vulnerability of the children, whereas Holmbeck et al. (2002) suggested it may be due to children’s reduction in competence. Additionally, relationships may be less positive for a variety of reasons such as
increased likelihood for parental depression which is associated with less warmth and less nurturing, decreased time spent together children experience long hospitalizations, or poorer communication if children’s illness results in speaking or hearing difficulties (Pinquart, 2013).

Furthermore, the emerging adult men and women who reported the most psychological problems also reported having a health condition, low physical quality of life, and low maternal relationship quality, highlighting that the combination of all these variables predicted the highest likelihood of experiencing psychological problems, similar to the parental distress model. In both men and women who reported high maternal relationship quality and low physical quality of life, having a health condition did not affect psychological problems. This finding also supports the idea that the most psychologically impairing factor of having a health condition may be the impact on physical quality of life. It also suggests that high maternal relationship quality may be a protective factor over any of the other psychologically damaging facets of having a health condition such as social and academic difficulties.

Reporting low maternal relationship quality was associated with higher psychological problems across all levels of variables in all men and women except those who reported having a health condition and low physical quality of life. The latter finding contradicts the current study’s hypothesis and the rest of the findings. This may suggest that having a poor maternal relationship does not significantly add a worsening effect on psychological problems when the individual also has a chronic illness and low physical quality of life. Additionally, the lack of effect may be due to the age of participants. That is, participants were all emerging adults and if their relationship with their mother has been poor for several years, it may not significantly affect them anymore above and beyond their health condition and negative quality of life as they learn to accept the poor nature of their relationships. It is also possible that these groups of individuals
are experiencing a factor that is increasing their psychological problems that was not measured in this study. For example, this study took place during the COVID-19 pandemic which has infected millions and left lasting effects in many of those infected. These effects have been termed as Long COVID, characterized by “fatigue, cough, chest tightness, breathlessness, palpitations, myalgia and difficulty to focus” as well as impaired balance and gait, insomnia, headache, joint pain, and weakness lasting weeks or months beyond the initial infection (Raveendran et al., 2021, pg. 869). Long COVID could contribute to these individuals’ low physical quality of life scores and potentially increased psychological problems but were not measured as a chronic illness. Additionally, Long COVID may worsen the symptoms experienced by individuals who have a health condition. For example, individuals with chronic migraines may experience even more headaches than are typically caused by their health condition due to Long COVID, or individuals with cystic fibrosis may have an increased amount of damage to their lungs and experience exponentially worse breathing and coughing. As reported by Google News, by the end of data collection, there was a total of 7,200 cases of COVID-19 within the county.

**Limitations and Future Directions**

Although the current study demonstrated several strengths including sample size, power, and reliable and valid measures, several limitations must be discussed. The study was prevented from determining causality due to the nature of a cross-sectional analysis. Future research could examine if having a pediatric chronic illness causes a decrease in parent-child relationship quality and/or an increase in parental psychological problems or if the poor relationship and psychological health causes worsening health conditions. The variables analyzed in this study
should be considered by future researchers and analyzed using different methods such as in a longitudinal study.

The participants were all college-attending students, a subset of all emerging adults, limiting the external validity of the study. Further, emerging adults with a chronic illness are less likely to pursue higher education (Maslow, 2011; Pinquart, 2014); this may be due to a plethora of reasons including the fact that some health conditions (e.g., cancer) require frequent and intensive treatment which limits available time to dedicate to higher education as well as the fact that some health conditions (e.g., Epilepsy, Cerebral Palsy, Multiple Sclerosis) may render the individual physically and mentally incapable of completing the demands of college. Therefore, the individuals who participated in the study are not representative of all emerging adults with health conditions, further reducing the external validity. Future research should examine the variables analyzed in this study in emerging adults with chronic illnesses who did not attend college. Additionally, the study took place at a Southern United States university which continues to limit the external validity; however, other researchers have identified unique parenting approaches in the southern United States (Flynn, 1996; McKinney & Brown, 2017; McKinney et al., 2018) and this study gives additional information about parental distress and parent-child relationships in southern United States students with and without health conditions. For example, Gul et al. (2021) describes the “culture of honor” that exists in the southern United States which involves the belief that men are to be strong and protect the family from perceived threats while women are expected to exercise chastity and loyalty to the family. Future research should determine how this culture of honor affects families that have a child with a chronic illness. It is possible that the parents could become more protective of their child or become
more easily distressed if they feel their child will not be able to uphold their duties when they mature.

Another limitation of the study would be the measure of health condition severity (i.e., report of health condition * physical quality of life). Recently, researchers have been creating severity measures for specific illnesses such as Parkinson’s disease (Ambrosio et al., 2020), heart failure (Ambrosio et al., 2021), and obstructive pulmonary disease (Corchon et al., 2021), however, no measure of severity for health conditions in general appears to exist. Future researchers should consider creating a measure that assesses severity of any chronic illness for a wider range of utility of the measure in the field.

Shared-method bias may be a limitation of the current study since emerging adults were asked to report on the psychological distress of their parents. It is possible that their reports or perceptions of their parents’ psychopathology are not completely accurate. For example, chronic illnesses often cause financial and economic strain (Holmes & Deb, 2003) of which the children may not be aware. Additionally, individuals who experience psychological problems are more likely to recall negative aspects of their lives and may also distort those memories (Otgaar et al., 2017) which may be reflected if they experience poor relationships with their parents. However, emerging adults’ reports on current perceptions of their parents can provide important information on how emerging adults may be affected by certain parental factors (McKinney & Kwan, 2018).

Finally, this study did not assess or control for socioeconomic status. Previous research has found that socioeconomic status is positively linked to physical and mental quality of life (Wippold et al., 2021; Ashing-Giwa, 2005). Future research should be done to consider the impact socioeconomic status has on the outcomes of individuals with health conditions and the
impact it has on parent-child relationship quality, parental psychopathology, and child psychopathology.

Since this study’s findings suggest that a decrease in physical quality of life could be the most psychologically impairing factor in those with chronic illnesses, future research should explore what facets of having a health condition are the most psychologically impairing. For example, research has shown that a consequence of having a chronic illness is that it increases the likelihood that the individual experiences more social and personal challenges (Snelgrove et al., 2016); research should investigate the psychological impact of each consequence of having a health condition. For example, health conditions such as Multiple Sclerosis, Cerebral Palsy, ALS, Osteoporosis, etc., cause a decrease in physical abilities while conditions such as sleep apnea, thyroid disease, kidney disease, migraines, etc., reduce cognitive abilities. Therefore, research should determine if there are different psychological consequences of health conditions that reduce physical and/or cognitive ability.

Previous research focusing on the parent-child relationship in families with a child with a chronic illness is scarce but has shown that the quality of the relationship tends to be lower (Pinquart, 2013; Szajnberg et al., 1993). The results of the current study suggest that high maternal relationship quality could serve as a protective factor over psychologically damaging factors of having a health condition; future research should further explore the impact of health conditions on parent-child relationships as well as how the relationships may function as a protective factor against psychological problems through longitudinal research or through experimental manipulations in which the researcher would observe interactions (i.e., solving a puzzle together) between parents and their child with or without a chronic illness and rate and compare interactions.
REFERENCES


https://doi.org/10.1080/08870446.2016.1167209


https://doi.org/10.1037/pas0000954.supp (Supplemental)


APPENDIX A

TABLES
### Table 1

**Participant Demographics**

**Age**
Range = 18 to 25  
\( M = 19.04, SD = 1.64 \)

**Sex**
53.5% female  
46.5% male

**Race**
78.6% White or European American  
13.6% Black or African American  
4.3% Asian or Asian American  
1.9% Hispanic or Latino/a  
0.4% Native Hawaiian or Pacific Islander  
0.2% American Indian or Alaska Native  
1.1% Different than those above

**Living in parental household**
84.2% Two biological parents  
9.5% Biological Mother & Stepfather  
2.6% Grandparent(s)  
2.0% Biological Father & Stepmother  
1.3% Adoptive Mother and Father  
0.4% Aunt(s) and/or Uncle(s)

<table>
<thead>
<tr>
<th>Parent’s highest degree</th>
<th>Maternal Figure</th>
<th>Paternal Figure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduate</td>
<td>30.7%</td>
<td>27.5%</td>
</tr>
<tr>
<td>Bachelor’s</td>
<td>40.1%</td>
<td>36.6%</td>
</tr>
<tr>
<td>Associate’s</td>
<td>11.1%</td>
<td>9.9%</td>
</tr>
<tr>
<td>High school</td>
<td>17.7%</td>
<td>24.0%</td>
</tr>
<tr>
<td>&lt;High School / Other</td>
<td>0.4%</td>
<td>2.0%</td>
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Table 2

*Invariance Testing for Sex*

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<th>$\chi^2 (df)$</th>
<th>CFI</th>
<th>SRMR</th>
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<td>M1: Configural Invariance</td>
<td>153.99(30)</td>
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<td>.061</td>
</tr>
<tr>
<td>M2: Metric Invariance</td>
<td>162.42(36)</td>
<td>.956</td>
<td>.060</td>
</tr>
<tr>
<td>M3: Scalar Invariance</td>
<td>192.66(44)</td>
<td>.947</td>
<td>.060</td>
</tr>
<tr>
<td>M4: Residual Invariance</td>
<td>229.63(59)</td>
<td>.941</td>
<td>.083</td>
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</table>
Table 3

*Final Measurement Model Items with Factor Loadings*

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<td>Women</td>
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<tr>
<td><strong>Maternal Construct</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Maternal Regard for Child</td>
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<td>0.87</td>
<td></td>
</tr>
<tr>
<td>Child Regard for Mother</td>
<td>0.88</td>
<td>0.85</td>
<td></td>
</tr>
<tr>
<td>Maternal involvement</td>
<td>0.85</td>
<td>0.87</td>
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</tr>
<tr>
<td>Maternal Conflict</td>
<td>-0.68</td>
<td>-0.65</td>
<td></td>
</tr>
<tr>
<td><strong>Paternal Construct</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Paternal Regard for Child</td>
<td>0.88</td>
<td>0.78</td>
<td></td>
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<tr>
<td>Child Regard for Father</td>
<td>0.87</td>
<td>0.83</td>
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<tr>
<td>Paternal Involvement</td>
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<tr>
<td>Paternal Conflict</td>
<td>-0.65</td>
<td>-0.66</td>
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Table 4

*Standardized Effects on Emerging Adult Psychological Problems*

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<th></th>
<th>Female $\beta$</th>
<th>Male $\beta$</th>
</tr>
</thead>
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<td><strong>Parental Psychological Distress Model</strong></td>
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<td></td>
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<tr>
<td>Main Effects</td>
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<td>0.11*</td>
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<td>Physical Quality of Life</td>
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<td>.42**</td>
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<tr>
<td>Paternal Distress</td>
<td>.42**</td>
<td>.11</td>
</tr>
<tr>
<td><strong>Lower-Order Two-Way Interactions</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health condition * Physical Quality of Life</td>
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<td><strong>Hypothesized Three-Way Interactions</strong></td>
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<td>.35*</td>
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<td>-.19</td>
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</table>

**Parent-Child Relationship Quality Model**

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<td>Main Effects</td>
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<td>.12*</td>
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<td>Physical Quality of Life</td>
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<td>-.45**</td>
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<tr>
<td>Maternal Relationship Quality</td>
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<td>-.30**</td>
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<td>.01</td>
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<td><strong>Lower-Order Two-Way Interactions</strong></td>
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<td>Health Condition * Physical Quality of Life</td>
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<td>Maternal Relationship Quality * Health Condition</td>
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*Note.* * indicates $p < .05$ and ** indicates $p < .01$. 

43
Table 5

*Frequency of Participant Health Conditions*

<table>
<thead>
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<th>Health Condition</th>
<th>f</th>
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<tbody>
<tr>
<td>AIDS</td>
<td>2</td>
<td>Hypertension</td>
<td>14</td>
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<tr>
<td>Anorexia</td>
<td>17</td>
<td>Hypotension</td>
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<tr>
<td>ALS</td>
<td>0</td>
<td>Kidney Disease</td>
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<td>Asthma</td>
<td>73</td>
<td>Lyme Disease</td>
<td>0</td>
</tr>
<tr>
<td>Arthritis</td>
<td>17</td>
<td>Migraines</td>
<td>95</td>
</tr>
<tr>
<td>Autoimmune disease/disorder</td>
<td>8</td>
<td>Metabolic disorders</td>
<td>3</td>
</tr>
<tr>
<td>Cancer</td>
<td>2</td>
<td>Multiple Sclerosis</td>
<td>0</td>
</tr>
<tr>
<td>Cerebral Palsy</td>
<td>0</td>
<td>Narcolepsy</td>
<td>1</td>
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<tr>
<td>Chronic Fatigue Syndrome</td>
<td>2</td>
<td>Neurodegenerative Disease</td>
<td>0</td>
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<td>Obstructive Pulmonary Disease</td>
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<td>Obesity</td>
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<td>Chronic Pain</td>
<td>17</td>
<td>Oral Disease</td>
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<td>Cystic Fibrosis</td>
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<td>Osteoporosis</td>
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<td>Diabetes</td>
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<td>Enuresis/Encopresis</td>
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<td>Fibromyalgia</td>
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<td>Genetic Disorders</td>
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<td></td>
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Table 6

*Mean Comparisons*

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<tr>
<td>Physical Quality of Life</td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
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<td>16.57</td>
<td>2.46</td>
<td>16.71</td>
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<td>Maternal Psychological Distress</td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
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<td>12.90</td>
<td>14.49</td>
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<tr>
<td>Paternal Psychological Distress</td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td></td>
<td>8.21</td>
<td>10.67</td>
<td>8.20</td>
<td>11.90</td>
</tr>
<tr>
<td>Maternal Parent-Child Relationship Quality</td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td></td>
<td>0.33</td>
<td>6.41</td>
<td>-0.34</td>
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<td>Paternal Parent-Child Relationship Quality</td>
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<td>M</td>
<td>SD</td>
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<td>SD</td>
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<td>35.98</td>
<td>55.99</td>
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*Note.* * indicates significant difference between female and male mean scores at *p* < .01.
Table 7

*Correlations among Variables*

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<th>4.</th>
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<th>6.</th>
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<td>1. Health Condition</td>
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<td>.21*</td>
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*Note.* * indicates $p < .01$. Correlations for males and females appear above and below the diagonal, respectively.
APPENDIX B

FIGURES
Figure 1

Moss-Morris (2013)’s Working Model of Adjustment to Chronic Illness

PERSONAL BACKGROUND FACTORS
- Early life experiences; Personality (e.g., optimism, neuroticism)
- Values and life goals
- Demographics (e.g., age)

ILLNESS-SPECIFIC FACTORS
- Nature of symptoms
- Degree of disability/disfigurement
- Degree of uncertainty
- Prognosis
- Treatment regime and side effects

BACKGROUND SOCIAL AND ENVIRONMENTAL FACTORS
- SES; Physical environment
- Availability of health & social care
- Social support
- Relationships with others

POSSIBLE KEY CRITICAL EVENTS
- Development of initial symptoms of illness
- Diagnosis of chronic condition
- Relapse and/or disease progression
- Threat to mortality
- Change in identity/life roles

POSSIBLE ONGOING ILLNESS STRESSORS
- Managing social relationships and relations with health professionals/social services
- Uncertain future
- Preserving autonomy
- Acknowledging limits
- Managing stressful/ongoing treatments, lifestyle changes, disability, disfigurement, and symptoms

Disrupts emotional equilibrium and current quality of life

SUCCESSFUL ADJUSTMENT (return to equilibrium)
- Examples of factors helpful for adjustment (need to examine empirically within context of illness and related adaptive tasks and critical events)

Cognitive Factors
- Self-efficacy/sense of control regarding disease management
- Self-efficacy regarding generic life situations
- Benefit finding (positive re-interpretation)
- Acceptance of illness
- High perceived social support

Behavioural Factors
- Coping by using problem-focused strategies, planning and/or seeking social support
- Engagement in good health behaviours
- Adherence to medical and self-management regimes
- Maintaining activity levels in the face of illness
- Appropriate expression of emotion

ADJUSTMENT DIFFICULTIES (ongoing disequilibrium)
- Examples of factors unhelpful for adjustment (need to examine empirically within context of illness and related adaptive tasks and critical events)

Cognitive Factors
- High perceived stress
- Coping through wishful thinking
- Negative illness/symptom representations
- Dysfunctional cognitions/cognitive errors & biases, e.g., catastrophising
- Helplessness
- Suppression of negative affect

Behavioural Factors
- Coping through avoidance
- Unhelpful responses to symptoms (consistently reducing activity/resting, focusing on symptoms)
- Venting or denying/repressing emotions

Good Psychological, Physical and Social Adjustment (e.g., less distress and interference/impact of illness on life roles and relationships; good illness management; high positive effect)

Poor Psychological, Physical and Social Adjustment (e.g., disproportionate distress and interference/impact of illness on life roles and relationships; poor illness management; low positive effect)
Conceputal Models of Moderation Analysis

**Parental Distress Model**

Health Condition * Physical Quality

Emerging Adult Psychological Problems

- Perceived Paternal Distress
- Perceived Maternal Distress

**Parent-Child Relationship Quality Model**

Health Condition * Physical Quality

Emerging Adult Psychological Problems

- Perceived Paternal Relationship Quality
- Perceived Maternal Relationship Quality

Note. The interaction of health condition and physical quality of life represents the presence and severity of health condition, which is then moderated by parental distress or relationship quality factors. Participant sex effects examined with multiple group analysis.
Figure 3

*Three-way Linear Interactions of Maternal Psychological Distress, Health Condition, and Quality of Life in Women and Men*
APPENDIX C

IRB APPROVAL LETTER
NOTICE OF DETERMINATION FROM THE HUMAN RESEARCH PROTECTION PROGRAM

DATE: May 25, 2021
TO: Clifford McKinney, PhD, Psychology,
PROTOCOL TITLE: Effects of Chronic Illness
FUNDING SOURCE: IRB-21-207
PROTOCOL NUMBER: Approval Date: May 25, 2021 Expiration Date: May 24, 2026

EXEMPTION DETERMINATION

The review of your research study referenced above has been completed. The HRPP has made an Exemption Determination as defined by 45 CFR 46.104(d). Based on this determination, and in accordance with Federal Regulations, your research does not require further oversight by the HRPP.

Employing best practices for Exempt studies is strongly encouraged such as adherence to the ethical principles articulated in the Belmont Report, found at www.hhs.gov/ohrp/regulations-and-policy/belmont-report/ as well as the MSU HRPP Operations Manual, found at www.orec.msu.edu/humansubjects. As part of best practices in research, it is the responsibility of the Principal Investigator to ensure that personnel added after this Exemption Determination notice have completed IRB training prior to their involvement in the research study. Additionally, to protect the confidentiality of research participants, we encourage you to destroy private information which can be linked to the identities of individuals as soon as it is reasonable to do so.

Based on this determination, this study has been inactivated in our system. This means that recruitment, enrollment, data collection, and/or data analysis CANNOT continue, yet personnel and procedural amendments to this study are no longer required. If at any point, however, the risk to participants increases, you must contact the HRPP immediately. If you are unsure if your proposed change would increase the risk, please call the HRPP office and they can guide you.

If this research is for a thesis or dissertation, this notification is your official documentation that the HRPP has made this determination.

If you have any questions relating to the protection of human research participants, please contact the HRPP Office at irb@research.msu.edu. We wish you success in carrying out your research project.

Review Type: EXEMPT
IRB Number: I08G000467