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Marital quality and depression as mediators linking childhood maltreatment to adult physical health

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ABSTRACT

Background: Childhood maltreatment is known to influence adult physical health among midlife adults. Evidence suggests that depressive symptoms mediate the association. However, research has discounted the role of marital quality in understanding health outcomes among adults maltreated in childhood.

Objective: To advance this line of inquiry, we examined the relationship between marital quality and depressive symptoms in a sequential mediation model linking childhood maltreatment to adult physical health over ten years.

Participants and setting: Our sample consisted of midlife adults ($n = 550$) from three waves of the Midlife Development in the United States (MIDUS) study. The majority ($n = 91.4\%$) were white. At MIDUS 2, the mean age was 54.84 ($SD = 10.78$) and the mean age at MIDUS 3 was 63.96 ($SD = 10.81$).

Methods: Structural equation modeling was used to examine the degree to which marital quality and depressive symptoms mediated the relationship between childhood maltreatment and adult physical outcomes. Bootstrapping procedures were used to estimate the indirect effects.

Results: The serial mediation effects from maltreatment to adult physical health through marital quality and depressive symptoms were significant. Likewise, the simple indirect effects from maltreatment to subjective evaluations and the number of chronic health conditions through depressive symptoms were also significant.

Conclusions: Childhood maltreatment is linked to adult physical health problems through marital quality and depressive symptoms, suggesting that the quality of adult marriages may play a critical role in health outcomes. Improving the quality of marriages may reduce risk factors, such as depression, that potentiate future physical health problems.

1. Introduction

Childhood maltreatment (CM) has been consistently linked to physical health problems in midlife and older adults. Research has shown that CM is associated with poor evaluations of physical health problems (Fitzgerald et al., 2021), specific health conditions (Afifi et al., 2013), and an enhanced likelihood of reporting multiple health conditions (Springer, 2009), which increases disease burden such as health care costs and utilization (Lehnert et al., 2011). Additionally, adults maltreated in childhood (AMIC) have a

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greater likelihood of being physically disabled, functionally impaired, and use health care services more often (Hager & Runtz, 2012; Sachs-Ericsson et al., 2011). It is critical to examine possible pathways linking CM to adult physical health to reduce morbidity and mortality and their associated costs. Additionally, it remains unclear whether CM is associated with changes in physical health problems over time. This is particularly important because 60 % of adults in the United States have at least one chronic health condition. Chronic health conditions frequently require consistent medical attention. Further, people with chronic health conditions often have functional impairment experiences or issues related to activities of daily living (CDC; Center for Disease Control, n.d.). Roughly 40 % of adults have two or more conditions. The economic cost of treating chronic physical health is an astounding 3.8 trillion dollars per year with approximately 90 % of those costs directly allocated to treatment (CDC, n.d.). Understanding pathways linking an established risk factor such as CM to adult physical health over time can inform prevention efforts leading to reduced health care costs, less health care utilization, and improved quality of life. Further, midlife and older adults are at enhanced risk for developing chronic physical health conditions, so the effects of CM and its consequences may be especially salient in this population.

Among AMIC, marital quality may mediate the relationship between CM and later depressive symptoms (Fitzgerald, 2022), which have significant implications for adult health (Robles et al., 2014). In this study, we conceptualize marital quality as a multidimensional construct (Bryant et al., 2016) using three indicators: (1) support (i.e., the degree to which partners can open up to one another); (2) strain (i.e., how partners impose stress on one another), and dis/agreement (i.e., the degree to which partners agree on major aspects of marriage including money, division of labor, and time spent together), which provides a specific understanding of what aspects of marriage may influence health. Kiecolt-Glaser and Newton (2001) and Thoits (2011) commonly suggest that marital quality indirectly influences adult physical health through numerous pathways including health behavior, psychopathology, individual differences, and physiological dysregulation. Taken together, this emerging body of literature suggests AMIC may experience lower quality marriages, leaving them vulnerable to mental and physical health problems. Yet, questions remain about how marital quality and subsequent depressive symptoms influence adult physical health over time, particularly among AMIC. There is value in investigating both subjective and objective measures of health as they both psychological (e.g., perceptions and appraisals) and physical indicators (e.g., diagnoses) of health contribute to health over time. The current study will examine a serial mediational model where marital quality and subsequent depressive symptoms will mediate childhood maltreatment to adults' subjective evaluations of their physical health and the number of chronic physical health conditions. The data are from three waves of the study of Midlife Development in the United States (MIDUS), offering an important longitudinal examination of the role marital quality plays in mitigating the effects of CM later in life.

1.1. Theoretical and conceptual background

Attachment theory is a particularly useful lens in understanding adult relationships and health, as it situates adults' wellbeing as an outcome of "cradle to grave" relational experiences (Simpson & Howland, 2012). That is, relational interactions throughout our lives scaffold adult interpersonal functioning. Beginning in infancy children establish proximity to their primary caregiver by expressing their needs verbally (e.g., language) and nonverbally (e.g., crying, crawling, etc.) (Ainsworth & Bowlby, 1991; Mikulincer & Shaver, 2012). For example, when attachment figures are reliably, consistently, and warmly responsive children tend to develop secure attachment styles, promoting a positive sense of self and others (Mikulincer & Shaver, 2012). Conversely, when attachment figures are inconsistently available or lack a quality response (e.g., use of harsh critical parenting) children tend to develop insecure attachment styles (i.e., anxious, avoidant, and disorganized) characterized by uncertainty, doubts, fear, and anxiety about their self-efficacy and the dependability of others (Mikulincer & Shaver, 2012). Although attachment styles can shift throughout one's life, scholars agree that childhood attachment experiences are fairly predictive of adult attachment styles (Bowlby, 1988; Lowell et al., 2014).

Based on the abundance of research examining the through line of childhood maltreatment to adult attachment and psychological wellbeing, we must situate associations between childhood maltreatment and adult outcomes within tenets of attachment theory. Children who experience abuse and neglect are more likely to perceive their primary caregivers as unsafe and a threat to their wellbeing (Lowell et al., 2014). Through abuse and neglect, maltreated children usually fear the person (e.g., parent) who is supposed to represent safety. Indeed, research demonstrates that maltreated children are significantly more likely to develop disorganized attachment styles, in which there is a fear of trusting others (Carlson et al., 1989; Lyons-Ruth et al., 1993). The disruptions in attachment in childhood then leaves adults more vulnerable to poorer quality marriages via greater attachment insecurity in adulthood (Riggs et al., 2011). Guided by the attachment theory assumption that early childhood attachment experiences shape adult relationships, we expect CM to be associated with poorer marital quality. And, although there is a plethora of research examining associations between CM and adult attachment experiences, little attention has been paid to interactions between CM, marital quality, and adult physical health.

1.2. Childhood maltreatment and adult physical health

Recent research has noted that CM is associated with poorer physical health among midlife and older adults. For example, CM has been associated with risk factors for physical health problems including allostatic load (Widom et al., 2018) and inflammation (Renna et al., 2021) as well as specific diseases such as cardiovascular disease and type II diabetes (Basu et al., 2017). Afifi et al. (2013) found that CM was associated with increased risk for arthritis, hypertension, hepatic disease, diabetes, cardiovascular disease, and obesity. More recently, research has demonstrated that CM is associated with a higher risk for obesity, hypertension, chronic obstructive pulmonary disease, and myocardial infarction (Clemens et al., 2018). In addition to associations between maltreatment specific health conditions, CM has also been associated with poorer subjective physical health (Springer, 2009). Although research has begun to

explore the associations between CM and adult physical health, several notable gaps exist. First, there is little research examining whether childhood maltreatment is associated with changes in physical health over an adult's lifetime (see [Renna et al., 2021](#) for exception). Second, despite the knowledge that CM is an interpersonal betrayal ([Finkelhor & Browne, 1985](#)) that may heal through reparative relationship experiences ([Dalton et al., 2013](#)), little research has considered whether intimate relationships protect against long term mental and physical health problems.

1.3. Childhood maltreatment and adult marital and psychological outcomes

Despite research documenting biological ([Miller et al., 2011](#)), psychological ([Min et al., 2013](#)), and behavioral mediators ([Springer, 2009](#)) linking maltreatment to adult physical health, there has been little empirical inquiry in the way of considering marital quality. Numerous studies have found that CM is associated with poorer quality relationships. For example, [Whisman \(2006\)](#) found that childhood sexual abuse was associated with a poorer quality marriage. In a prospective study, found that CM was associated with poorer quality relationships, greater relationship instability, and enhanced likelihood of infidelity. More recent research using the MIDUS data has expanded on the previous findings. For example, found that adults who reported higher levels of CM also reported offering fewer provisions of emotional support to their marital partners. Also using the MIDUS data, [Fitzgerald \(2022\)](#) found that AMIC perceived a less supportive and more strained emotional climate with their spouse. These findings suggest that CM may lead to more negative interactional patterns between marital partners, thereby decreasing marital quality. Supporting this notion, [Whisman \(2014\)](#) found that adults who were physically abused in childhood perceived their partners to engage in fewer supportive and more strained interactions. Likewise, the partners of adults who were abused also perceived the survivor to engage in fewer supportive and more strained interactions. Additionally, CM has been linked to more frequent conflict ([Fitzgerald, 2021](#)), less trust in their partners ([DiLillo & Lang, 1999](#)), and intimate partner violence ([Godbout et al., 2009](#)). Negative internal working models among AMIC may leave adults vulnerable to poorer quality marriages that ultimately influence adult mental and physical health. The role marriages play concerning adult mental and physical health outcomes, however, remains in its infancy with few studies examining such relationships.

It is well-established that CM is associated with mental health problems with depression being the most common outcome. Numerous studies have shown that CM is associated with depressive disorders and subclinical depressive symptoms ([Kuhlman et al., 2017](#); [Nanni et al., 2012](#)). For example, using data from the seminal Adverse Childhood Experiences study, [Chapman et al. \(2004\)](#) found that childhood maltreatment was associated with an enhanced likelihood of reporting both a recent episode of major depression as well as lifetime prevalence of major depression. More recently, a meta-analysis linking CM to adult depression yielded several important findings. First, they found that AMIC were nearly three times more likely to report depression in adulthood. Further, they found that adults who reported more severe maltreatment also reported more severe depression in adulthood, suggesting a dose-response relationship ([Nelson et al., 2017](#)).

Marriages are among the most critical relationships individuals will have during their lifetime. Not surprisingly, marriages strongly influence adult mental and physical health. Concerning mental health, the marital discord model of depression ([Beach et al., 2003](#)) suggests that more frequent marital conflict, strain, and stress, coupled with fewer opportunities for support and intimacy within marriages, can potentiate the development of psychopathology including depression, anxiety, and substance (see [Whisman & Baucom, 2012](#) for review). Further, these associations are documented cross-sectionally and longitudinally ([Whisman & Baucom, 2012](#)). Because CM is associated with more negative interactions, fewer positive interactions, poorer quality marriages, disorganized attachment styles, and negative internal working models, this group of adults may be at increased risk for depression. Indeed, recent research has found that marital quality plays a vital role in understanding depression among AMIC. In a longitudinal analysis of midlife adults, [Fitzgerald \(2022\)](#) found that the combination of greater frequency of positive interactions and fewer negative interactions partially mediated the relationship between CM severity and depressive symptoms. From an attachment theory, we might see a high ratio of positive to negative interactions as a broad corrective attachment scenario for AMIC.

1.4. Adult depression and physical health

Depressive symptoms have been consistently linked to long-term physical health. A large body of research has suggested that depressive symptoms are associated with physical health problems. For example, research has documented that depression has been linked to dementia ([Barnes et al., 2012](#)), obesity ([Vittengl, 2018](#)), allergies, arthritis, asthma, bladder problems, joint problems, skin problems, ulcers, and diabetes ([McCarthy-Jones & McCarthy-Jones, 2014](#)). Others have also found that depression was associated with more negative health perceptions, higher body mass index (BMI), high blood pressure, and poorer quality sleep ([Jones et al., 2020](#)). Not surprisingly, [Chen and Austin \(2019\)](#) found that depressive symptoms were negatively associated with overall subjective evaluations of adult's physical health.

1.5. Present study

There are two distinct bodies of literature related to this topic: (1) The association between marital quality with physical health outcomes through mental health problems, and (2) research noting the detrimental impact childhood abuse can have on adult mental and relational health issues. However, few studies have concurrently considered adult mental and relational health as pathways linking CM to adult physical health over time. Considering these pathways concurrently is critical because trauma-informed approaches to couple therapy may be needed to improve marital functioning ([Dalton et al., 2013](#)) reduce depressive symptoms, and ultimately improve adult physical health. In this study, we analyzed three waves of data to examine marital quality and depressive

symptoms in a serial mediational model linking CM to adult physical health over a 10-year period. We hypothesized that childhood maltreatment would be directly associated with marital quality and depressive symptoms. Prior research has noted that marital quality only partially mediates the relationship between CM and depressive symptoms (Fitzgerald, 2022). Next, we hypothesized that marital quality would be associated with fewer depressive symptoms, which, in turn, will be associated with adult subjective evaluations of adult physical health and the number of chronic health conditions (Kiecolt-Glaser & Newton, 2001; Robles et al., 2014). Because the relationship between marital quality and physical health has been previously mediated by psychological, behavioral, and physiological factors, we did not expect a direct relationship between marital quality and physical health. Last, we expected marital quality and subsequent depressive symptoms to be significantly associated in a serial mediational model. To more clearly understand the association between CM and adult physical health over time, we included baseline reports of both depression and physical health so that longitudinal association can be established, age, gender, and education symptoms. Sociodemographic factors have been previously linked to both mental and physical health where older adults become more vulnerable to health problems as they age just as women and those with lower educational achievement are (da Rocha et al., 2014).

2. Method

Data from the current study were taken from the MIDUS study. The MIDUS is a multi-wave longitudinal study that has been continually funded by the John D. and Catherine T. MacArthur Foundation Research Network. The MIDUS data are freely available from the Inter-university Consortium for Political and Social Research (<https://www.icpsr.umich.edu/web/NACDA/series/203>). The first wave of data was collected from 1995 to 1996 (MIDUS 1), the second wave of data was collected between 2004 and 2006 (MIDUS 2), and third wave of data collection was conducted between 2013 and 2015 (MIDUS 3). Each of these three waves consisted of a telephone interview and a self-administered questionnaire (SAQ). In addition to data from MIDUS 1–3, following MIDUS 2 there was an additional biomarker data collection. In the biomarker study, additional questionnaires were administered to a subset of individuals who completed both the telephone interview and SAQ at both MIDUS 1 and 2 ($n = 1054$) and a new subsample of racial minorities ($n = 201$). Adults were included in the current study if 1) they participated in the MIDUS 2, MIDUS 2 biomarker study, and MIDUS 3; and 2) were continuously married to the same partner from MIDUS 2 to MIDUS 3; and 3) had no history of divorce as to create a homogenous sample of adults. The analytic sample included 560 adults (94.5 % White, 1.6 % African American, 1.3 % Native American, 2.3 % reported being “other,” and 0.4 % did not report race). At MIDUS 2, the mean age was 54.84 ($SD = 10.78$), at the MIDUS 2 biomarker study the mean age was 57.66 ($SD = 10.65$), and finally the mean age at MIDUS 3 was 63.96 ($SD = 10.81$). Additional sample characteristics are presented in Table 1. The current study was not preregistered.

The marital quality variables and covariates were harvested from the MIDUS 2 data for the current study. Depressive symptoms were drawn from the biomarker follow-up study between 6 and 60 months following the MIDUS 2 data collection to establish a longitudinal relationship between marital quality and depressive symptoms. Physical health was measured at both MIDUS 2 (covariate) and MIDUS 3 (outcome) to assess changes in physical health over nine years. Physical health was measured in two ways: subjective evaluations of adult physical health issues and the number of chronic physical health conditions. One methodological consideration worth noting is that we used the Childhood Trauma Questionnaire (CTQ) (assessed at the biomarker follow up study), to measure child maltreatment. Although MIDUS 1 assessed physical and emotional abuse using a version of the Conflict Tactics Scale (CTS), it did not assess sexual abuse, physical neglect, or emotional neglect. This is conceptually problematic because it does not fully capture childhood abuse and neglect, which may lead to underestimating the associations between childhood maltreatment and the

Table 1
Sample characteristics.

	<i>M (SD)/N (%)</i>
Gender	
Male	278 (49.6 %)
Female	282 (50.4 %)
Race	
White	503 (91.4 %)
Racial minority	47 (8.6 %)
Income	\$89,399.97 (\$72,500.00)
Age	
MIDUS 2	54.84 (10.78)
MIDUS 2 biomarker	57.66 (10.65)
MIDUS 3	63.96 (10.81)
BMI	28.91 (7.83)
MIDUS 2 depressive symptoms	0.40 (1.39)
Education	
Highschool or less	129 (23.1 %)
Some college but no degree	116 (20.8 %)
Two-year degree	37 (6.6 %)
College degree	144 (25.8 %)
Some graduate school but no degree	23 (4.1 %)
Masters or doctorate	110 (19.6 %)

Note. One person did not know their level of educational achievement.

mediating and outcome variables. This is particularly true because the current study considered the overall severity of maltreatment (e.g., dose-response), thus the CTS misses critical dimensions of maltreatment that would significantly bias results. Further, the CTQ demonstrates strong test-retest reliability (Bernstein et al., 2003). Thus, we decided that the CTS was an inferior measure of childhood maltreatment and was not used in the current study. Instead, we used the CTQ which was measured at the biomarker follow-up study (at second wave of data collection) because the strengths of the CTQ outweighed the limitation of being measured at the second wave of data collection and was used in the current study (Fitzgerald, 2022). Since the MIDUS data are de-identified and freely available to the general public, IRB approval was not required and is considered exempt.

2.1. Measures

2.1.1. Childhood maltreatment

CM was measured with the Childhood Trauma Questionnaire (CTQ; Bernstein et al., 2003). The CTQ is a 25-item scale assessing five types of childhood abuse and neglect prior to the age of 18. Subscales include emotional abuse, physical abuse, sexual abuse, emotional neglect, and physical neglect. The emotional neglect subscale and two items on the physical neglect were positively worded and reverse coded. Items are scored on a five-point Likert scale, ranging from (1) 'Never' to (5) 'Very Frequently.' The CTQ has been found to have construct validity and criterion-related validity (Bernstein et al., 2003). For the current study, the mean scores for each of the five subscales were used as indicators for a latent variable representing childhood maltreatment. Example items include "People in my family said hurtful or insulting things to me," "People in my family hit me so hard that it left me with bruises or marks," "Someone molested me," "I felt loved," and "My parents were too drunk or high to take care of me." Cronbach's alpha was 0.93, indicating very high reliability.

2.1.2. Marital quality

For the current study, marital quality was conceptualized as a multidimensional construct (Bryant et al., 2016) using three indicators: support, strain, and disagreement (Fitzgerald, 2022). The marital support variable indicator consisted of six items measured on a frequency scale ranging from (1) *A Lot* to (4) *Not at All*. An example item was, "Can you open up to him or her if you need to talk about your worries." Items were reverse coded, and a mean score of the six items was taken where higher scores reflect greater spousal support. The second indicator of marital quality was marital strain. Marital strain was measured with six items rated on a 4-point frequency (1) *Often* to (4) *Never*. An example item was "Does he or she make you feel tense." A mean score of the six items was taken. The final indicator of marital quality was disagreement. Disagreement was measured using three questions rated on a 4-point Likert-type scale with scores ranging from (1) *A Lot* to (4) *Not at All*. Participants were asked how often the individual disagreed on aspects of their marriage, including "money matters, such as how much to spend, save or invest," "household tasks, such as what needs doing and who does it," and "leisure time activities, such as what to do and with whom." A sum score was taken of the three items. Marital quality was measured at MIDUS 2. Cronbach's alpha for support = 0.90, strain = 0.88, and disagreement = 0.74, indicating overall strong scale reliability.

2.1.3. Depression

The Center for Epidemiologic Studies Depression (CES-D; Radloff, 1977) assessed depressive symptoms over the past week. The CES-D is a 20-item scale rated on a four-point Likert type scale ranging from (0) *Rarely or none of the time* to (3) *Most or all of the time* with three reverse coded items. Example items include "I felt depressed" and "I could not get going". Items were summed together to obtain an overall composite of depressive symptoms. Higher scores endorse higher levels of depressive symptoms. Depressive symptoms were measured at the MIDUS 2 biomarker project. Cronbach's alpha was 0.88.

2.1.4. Self-evaluated physical health

The health status of participants was assessed with a one-item index of subjective physical health status. The item asked, "In general, would you say your physical health is excellent, very good, good, fair, or poor?" The validity of self-rated health has been established in prior research (Umberson et al., 2006) and is predictive of future morbidity and mortality (Idler & Benyamini, 1997; Kiecolt-Glaser & Newton, 2001). The item was coded such that higher scores reflect poorer physical health. This item was included in the model as a covariate (MIDUS 2) and outcome variable (MIDUS 3).

2.1.5. Chronic physical health conditions

The MIDUS study asked participants about the presence or absence of 29 health conditions (e.g., thyroid disease and varicose veins) and participants responded either affirmatively or negatively. Participant's chronic health conditions were measured by summing the number of conditions endorsed by participants with a possible score of 0–29. Chronic health conditions were measured at both the MIDUS2 (covariate) and MIDUS3 (outcome variable). Cronbach's alpha was not calculated because the measure assesses specific physical health conditions and participants' lived experiences rather than a psychological construct.

2.2. Covariates

2.2.1. Depression

Depression was measured using a structured clinical interview developed from the World Health Organization's Composite International Diagnostic Interview (CIDI). Although this version of the CIDI was based on the Diagnostic and Statistical Manual of Mental

Disorders-3rd edition (DSM-III-R), the criterion for major depressive disorder is the same as specified in the DSM-5. Eight dichotomous items representing varying depressive symptoms were summed for an index of depression with higher scores reflecting a greater number of depressive symptoms. Depressive symptoms were measured at MIDUS 2. The CES-D was not available in the MIDUS 2 data; therefore, to establish a longitudinal relationship between marital quality at M2 and the CES-D, the CIDI was used as a covariate.

2.2.2. Gender

Gender was coded as Male/Female. Gender was measured at MIDUS 2.

2.2.3. Age

Age was entered in as a continuous variable. Age was measured at MIDUS 2.

2.2.4. Education

Educational achievement was measured with scores ranging from 1 (No schooling or some grade school) to 12 (Ph.D. or other professional degrees).

2.3. Statistical analysis

Descriptive Statistics were generated in SPSS V. 27 and structural equation model (SEM) was run in Mplus. SEM was used to examine the mediating role of marital quality and depressive symptoms linking childhood maltreatment to adult physical health outcomes. SEM compares the hypothesized theoretical model to the extent to which it fits the empirical data. To evaluate how closely the hypothesized model fits the empirical data, numerous statistics, including the comparative fit index (CFI), Tucker-Lewis index (TLI), root mean square error of approximation (RMSEA) and the chi-square statistic. CFI and TLI values above 0.90 demonstrate good fit and values greater than 0.95 demonstrate excellent fit. RMSEA values below 0.06 demonstrate excellent fit, and values below 0.08 demonstrate acceptable fit. Last, a non-significant chi-square statistic indicates excellent appropriate model-data fit (Hu & Bentler, 1999). However, the chi-square statistic is sensitive to larger samples despite being a good fitting model. To estimate the indirect effects bootstrapping procedures were used. Bootstrapping procedures provide a point estimate as well as 95 % confidence intervals. If zero lies between the upper and lower bound of the 95 % confidence interval, then the indirect effect is non-significant. Two separate SEM models were examined: a self-evaluated physical health model and several chronic health conditions model. There was no missing data in the current study.

3. Results

First, descriptive statistics, including correlations, means, and standard deviations, were examined and are displayed in Table 2. Regarding maltreatment prevalence rates, we used cutoff scores outlined by Walker et al. (1999), 19.8 % of adults reported physical abuse, 15.4 % reported sexual abuse, 21.4 % reported physical neglect, 19.1 % reported emotional abuse, and 12.9 % reported emotional neglect. Next, prior to examination of the mediational model the latent variable representing marital quality was examined to determine if the indicators of support, strain, and disagreement load onto the latent construct of marital quality. The factor loadings for the marital quality latent variable supported the notion that marital quality is a multidimensional construct. The factors of support ($\beta = 0.69, p < .001$), strain ($\beta = 0.90, p < .001$), and disagreement ($\beta = 0.60, p < .001$) all loaded significantly.

3.1. Self-evaluated physical health model

The results of both SEM models is presented in Fig. 1. The self-evaluated physical health model demonstrated adequate model-data fit: CFI = 0.97, TLI = 0.94, RMSEA = 0.05, SRMR = 0.02, $\chi^2(16) = 37.22, p = .002$. First, the direct effects from childhood maltreatment to mediators and outcomes were examined. More severe childhood maltreatment was negative associated with marital quality ($\beta = -0.17, p = .002$) where greater maltreatment severity was associated with poorer quality marriages. Further, childhood maltreatment was also associated with symptoms of depression ($\beta = -0.17, p < .001$) and subjective appraisals of physical health at M3 ($\beta = 0.09, p = .03$). Marital quality was negatively associated with depressive symptoms ($\beta = -0.15, p = .001$), but not associated

Table 2

Correlations, means, and standard deviations among study variables.

	1.	2.	3.	4.	5.	6.	M (SD)
1. Child maltreatment	–						36.26 (12.82)
2. Disagreement	0.07	–					5.61 (1.89)
3. Support	–0.16**	–0.41***	–				3.69 (0.45)
4. Strain	0.16***	0.55***	–0.62***	–			2.11 (0.56)
5. Depression	0.30***	0.14***	–0.15***	0.19***	–		6.52 (6.57)
6. Subjective health (M3)	0.22***	0.04	–0.05	0.03	0.31***		2.59 (1.00)
7. Chronic health conditions (M3)	0.19***	0.00	–0.06	0.07	0.29***	0.38***	3.03 (2.00)

** $p < .01$.

*** $p < .001$.

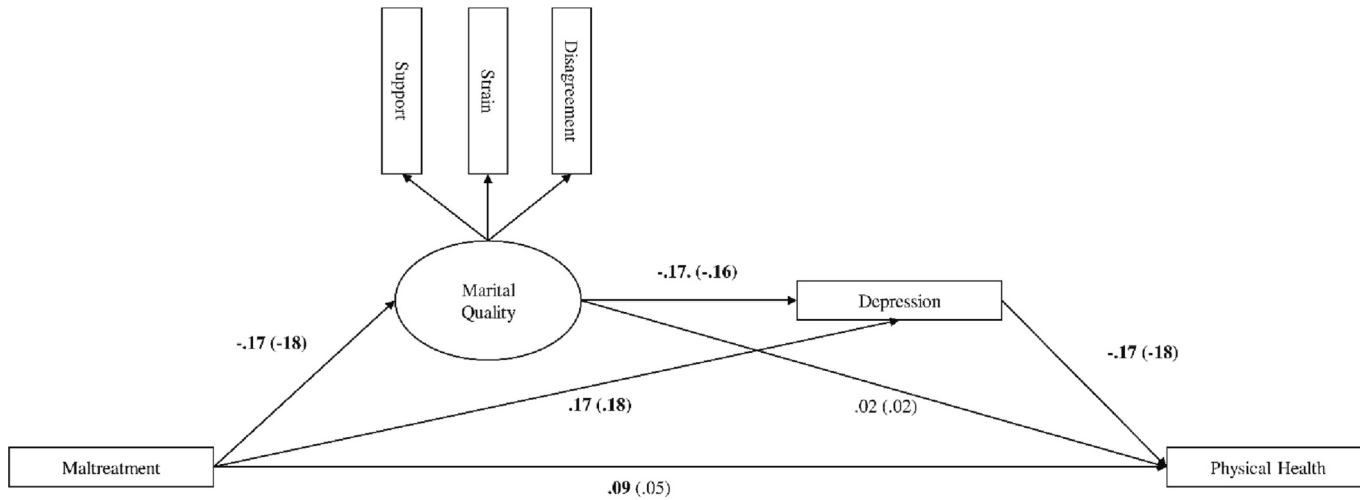


Fig. 1. Results of the structural equation model examining the effects from childhood maltreatment to adult physical health through marital quality, and depressive symptoms. Note. Estimates presented outside the parenthesis reflect self-evaluated model and estimates inside reflect chronic health conditions model. Covariates were removed from the model for ease of presentation.

with adult's self-evaluated physical health ($\beta = 0.02, p = .626$) indicating that higher quality marriages were associated with fewer depressive symptoms, but not health evaluations. Last, depressive symptoms were associated with self-appraisals of adult physical health ($\beta = 0.15, p = .002$) such that greater depressive symptoms were associated with more negative future evaluations of adult physical health. Overall, the model accounted for 29.5 % of the variance in self-rated physical health. Regarding the indirect effects, only two indirect effects were estimated; examination of marital quality as a mediator was not estimated because the association between marital quality and adult physical health was non-significant. The serial indirect effect from childhood maltreatment to adult physical health through marital quality and depressive symptoms was significant ($\beta = 0.004$; 95 % CI [0.001, 0.009]). Likewise, the indirect effect from maltreatment to appraisals of physical health through depressive symptoms was also significant ($\beta = 0.026$; 95 % CI [0.009, 0.047]).

3.2. Chronic physical health problems model

The chronic physical health condition model demonstrated adequate model-data fit: CFI = 0.97, TLI = 0.93, RMSEA = 0.05, SRMR = 0.02, $\chi^2(16) = 37, p = .002$. Regarding the direct effects, childhood maltreatment was associated with marital quality ($\beta = -0.18, p = .001$) such that more severe maltreatment was associated with a lower quality marriage. Likewise, childhood maltreatment severity was positively associated with depressive symptoms ($\beta = 0.18, p < .001$). Childhood maltreatment, however, was not directly associated with physical health at MIDUS 3 ($\beta = 0.049, p = .30$), such that maltreatment severity was not directly linked to number of chronic health conditions. Marital quality was negatively associated with future depressive symptoms ($\beta = -0.16, p < .001$) but not the number of chronic health conditions ($\beta = 0.02, p = .643$). Depressive symptoms were longitudinally associated with the number of chronic physical health problems where more severe depressive symptoms ($\beta = 0.17, p = .001$) predicted a greater number of chronic physical health conditions. Overall, 30.1 % of the variance in the number of MIDUS 3 physical health conditions was explained by the model. Results of the covariates can be seen in the Online supplementary material. Regarding the indirect effects, like the self-evaluated physical health model, only two indirect effects were estimated because marital quality did not predict the number of chronic physical health problems. The bootstrapped serial indirect effects from childhood maltreatment severity to the number of adult physical health conditions through marital quality and depressive symptoms was significant ($\beta = 0.005$; 95 % CI [0.001, 0.011]) where greater maltreatment was associated with lower levels of marital quality, which was then linked to greater depressive symptoms and subsequent chronic health conditions. Likewise, the indirect effect from maltreatment to the number of chronic physical health conditions through depressive symptoms was significant ($\beta = 0.030$; 95 % CI [0.010, 0.054]).

4. Discussion

Childhood maltreatment has been shown to impact adult physical health significantly. Consequently, it is essential to understand interceding factors that help account for the association to inform prevention and intervention efforts. Further, research indicates that marital quality influences physical health (Robles et al., 2014) through psychopathology (Kiecolt-Glaser & Newton, 2001). Despite these propositions, we could locate no study that considered the role marital quality and depressive symptoms play in linking childhood maltreatment to adult physical health. Given the influence of marital quality on adult health through depressive symptoms, understanding factors that shape marital quality and depression is vital to inform treatment. Considering childhood maltreatment as a distal factor is crucial because trauma-informed interventions may be required to more efficaciously improve marital quality (Dalton et al., 2013) and by extension reduce depressive symptoms and protect long term physical health problems. The current study used three waves of data from the MIDUS study to examine marital quality and depressive symptoms as mediators. Our findings indicated that depressive symptoms mediated the relationship between maltreatment and adult physical health. A novel finding of the study was that marital quality linked maltreatment to future depressive symptoms and ultimately adult physical health. The most notable contribution is that marital quality may be an important factor in understanding the link between childhood maltreatment and physical health via depressive symptoms. This finding maps well onto the tenets of attachment theory, in that early childhood experiences (i.e., maltreatment) are critical influences on physical health through marital quality (i.e., adult relationships). In this way, formative attachment experiences may have profound implications for emotional and physical health.

Indeed, the current study indicated that childhood maltreatment was indirectly associated with adult physical health through marital quality and subsequent depressive symptoms. Previous research has consistently noted that CM is associated with poorer quality relationships among midlife adults (Colman & Widom, 2004; Whisman, 2006) which is congruent with research on internal working models and leaves adults vulnerable to mental health problems (Godbout et al., 2009). Interpersonal relationships have been shown to link CM to adult mental health problems (Kong et al., 2018) but have seldom considered the role of marital partners (Fitzgerald, 2022). Marital partners can offer numerous psychosocial resources that may reduce depressive symptoms. Thoits (2011) suggested that marriages impact adult mental health through increased self-esteem, provisions of support, and perceiving that AMIC are important to their partner or "mattering"; especially important relational and attachment-based experiences for those who developed negative internal working models vis a vis child maltreatment. Likewise, the marital discord model of depression suggests that lower quality relationships are characterized by high levels of disagreement, strain, stress as well as fewer opportunities for support, intimacy and connection (Hollist et al., 2007). Taken together, marital quality may potentiate depressive symptoms (Whisman & Uebelacker, 2009), and this relationship is particularly important among AMIC (Fitzgerald, 2022).

Depressive symptoms may stem from poor-quality marriages and may influence adult physical health. Numerous reviews commonly suggest the depressive symptoms are a risk factor for physical morbidity (Kiecolt-Glaser & Newton, 2001; Robles et al., 2014; Thoits, 2011). For example, depression has been associated with numerous physiological processes that may influence adult

physical health problems including high blood pressure (Jones et al., 2020) and increased inflammation (Zainal & Newman, 2021), which are known risk factors for adult physical health problem (Kiecolt-Glaser & Newton, 2001; Robles et al., 2014). Likewise, depression has also been linked to maladaptive coping strategies that may shape the longitudinal course of adult health including greater substance use (Buckner et al., 2007), unhealthy eating habits (Crawford et al., 2011), and stress eating (Schreiber & Dautovich, 2017). Not surprisingly, research has found that depressive symptoms are associated with an increased likelihood of reporting physical health issues (Carnethon et al., 2007; Chirinos et al., 2017; Polenick et al., 2018).

Last, the study also documented that depressive symptoms mediated the longitudinal association between childhood maltreatment and adult physical health, independent of the effects of marital quality and the covariates. These findings are consistent with prior research suggesting that depressive symptoms link childhood maltreatment to adult physical health (Chen & Austin, 2019; McCarthy-Jones & McCarthy-Jones, 2014).

4.1. Limitations and future directions

The current study had several strengths, including a large sample of midlife adults in the United States and using a longitudinal design. The study is, however, not without limitations. First, the study utilized a retrospective measure of childhood maltreatment which may introduce bias into the model. The use of documented maltreatment records and prospective analysis could address these issues. Second, the sample consisted of primarily White, middle-class adults thus extrapolations to other cultural groups is severely limited. Third, the current study is limited by common method variance or systemic error due to collecting data in a singular way. The relationship among the variables is based on gathering data using the same methodology rather than the actual relationships among the constructs. Use of observation methods for marital quality, independent diagnostic assessment for depression, and medical records for physical health conditions could attenuate such problems. Fourth, the current study used a large sample drawn from the general population thus prevalence rates of childhood maltreatment are somewhat lower than in other samples (e.g., clinical samples). Finally, the current study examined a singular direction from CM to marital quality and subsequent depression. Future research would benefit from exploring a potential bidirectional relationship between marital quality and depression, and its impact on adult physical health, using cross-lagged mediation models.

4.2. Clinical implications

The current study found that depressive symptoms mediated the relationship between childhood maltreatment and adult physical health and advanced this line of research by demonstrating that marital quality may be a critical factor to consider in the context of adult health. Our findings may have important implications for prevention and intervention efforts. Focusing intervention on improving marital quality, with a particular emphasis on reducing depressive symptoms, may help reduce long-term physical health problems. Trauma informed couple therapy may be particularly effective, although research on sparse trauma informed couple therapy is sparse. Notably, Emotion Focused Couple Therapy (Dalton et al., 2013) demonstrates promise for improving marital quality among trauma survivors. Although the physiological impact of CM may have more longstanding effects on adult physical health (Miller et al., 2011), attending to marital quality and depressive symptoms may help mitigate the development of new physical health problems or reduce the severity of existing physical health problems among adults maltreated in childhood (Fig. 1).

5. Conclusion

The study found that marital quality and depression may be key mechanisms in understanding the association between childhood maltreatment and health. Critical findings include that both psychological and relational processes appear to negatively shape adult health over time. Even after experiencing maltreatment in childhood, there is hope that addressing distal difficulties associated with maltreatment, such as marital problems and psychopathology, can reduce health problems over time.

Author note

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This study was not preregistered.

Data availability

The data are free and publicly available

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.chiabu.2023.106189>.

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Further reading

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