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A Longitudinal Analysis of Stepfamily Relationship Quality and Adolescent Physical Health

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Abstract

Purpose—Approximately one-third of youth are estimated to live with a biological parent and stepparent before reaching adulthood. Additional research is warranted whereby stepfamily processes are identified that drive variation in youth adjustment, particularly physical health. We examined stepfather-child, mother-child, and stepcouple relationship quality as predictors of levels and changes in adolescent physical health over time.

Methods—We used a nationally representative sample of 1,233 adolescents living in biological mother-stepfather families from Waves I (1994–1995) and II (1996) of the National Longitudinal Study of Adolescent to Adult Health. We incorporated measures of stepfather-child, mother-child, and stepcouple relationship quality, as well as adolescent reports of 10 physical health symptoms at Waves I and II. Structural equation modeling was used to examine associations between Wave I stepfamily relationships and adolescent physical symptoms at Waves I and II. We used a zero-inflated negative binomial model to establish the validity of Wave II adolescent physical symptoms as a predictor of an index of diagnosed chronic illnesses by Wave IV (ages 26–32).

Results—Stepfather-child and mother-child relationship quality were negatively correlated with concurrent levels of adolescent physical symptoms. Stepfather-child relationship quality was negatively associated with change in adolescent physical symptoms over time. Adolescents with higher levels of physical symptoms at Wave II were more likely to report chronic illnesses by adulthood.

Conclusions—Stepfather-child relationship quality is a robust predictor of adolescent physical health throughout adolescence and is linked to chronic-illness diagnoses in young adulthood. Future research should explore further the mechanisms that underlie this association.

Keywords

adolescents; children; family; family relationships; physical health; stepfamily

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Approximately one-third of all children in the United States are estimated to live in a stepfamily before reaching adulthood [1, 2]. Stepfamilies are formed when one or both adults in a committed relationship bring a child or children with them from a previous relationship [3]. Members of stepfamilies often experience unique challenges, including declines in parent-child relationship quality, co-parental conflict, stepparenting issues, family role and boundary ambiguity, clashing family cultures, stepcouple disagreements about parenting strategies, loyalty binds, and complex child-custody arrangements [4–8]. Due to these unique challenges, some evidence suggests children residing in stepfamilies are at a heightened risk of experiencing adjustment problems relative to children who do not experience family instability and structural transitions [9].

Family processes are proximal facilitators or inhibitors of child adjustment in the context of family transitions [9, 10]. Within the stepfamily literature, relationship quality across key stepfamily dyads has been linked to child adjustment. For example, closeness with a stepfather is associated with declines in externalizing, internalizing, and academic problems among adolescents [11]. High-quality parent-child and stepparent-child relationships are also associated with reductions in stress among individuals who grew up in a stepfamily household [12]. Further, Bzostek [13] found that stepfather engagement was associated with concurrent declines in problem behaviors and increases in general health among a sample of young children.

Little is known about associations between stepcouple relationship quality and adolescent adjustment in stepfamilies [14]. This gap is noteworthy, as couple relationships are a central feature of stepfamily life. Research has also shown links between couple relationship quality and adolescent well-being in nuclear families [15]. Moreover, little is known about the extent to which stepfamily processes influence the physical health of adolescents over time in stepfamilies [10]. Generally, family structure and parental affection have been linked to the manifestation of physical symptomology in adolescents [16]. Specifically, adolescents residing in nuclear families with two parents report fewer physical symptoms than those residing with one parent, and adolescents who report higher levels of parental affection report fewer physical symptoms than adolescents who report lower levels of parental affection [16]. Others have highlighted the association between supportive parenting in the context of economic hardship and adolescent physical complaints [17].

Another important question centers on which stepfamily processes may be most influential in terms of adolescent physical health. Emotional security theory (EST) posits that child adjustment is promoted by family relationships marked by emotional availability, warmth, and responsiveness [18]. EST emphasizes the salience of interparental relationships in predicting youths' emotional security and stress. Interparental conflict is negatively associated with youth adjustment, and couples in stepfamilies are more likely to experience conflict than their counterparts in continuously intact nuclear families due to the challenges listed earlier [14]. Youths' emotional security is linked to youths' physiological responses in terms of cortisol reactivity, adrenocortical reactivity, salivary alpha-amylase, skin conductance levels, and respiratory sinus arrhythmia [19]. Thus, the quality of relationships in stepfamilies has important implications for youths' levels of stress, physiological responses, and subsequent physical well-being.

The Family Adjustment and Adaptation Response (FAAR) Model [20] posits that a family's ability to adjust over time is a function of a family's capabilities (i.e., psychosocial and tangible resources) and demands (i.e., daily hassles, ongoing strain, acute stressors). High-quality stepfamily relationships may represent psychosocial resources that stepfamilies can use to combat the demands of stepfamily life [20]. One key indicator that a family is adjusting well is the extent to which the family fulfills key functions, including the promotion of children's psychological, social, and physical health [20].

Together, EST and the FAAR model emphasize the importance of all residential family relationships, including couple, parent-child, and stepparent-child relationships. A focus on all key stepfamily subsystems as antecedents to adolescent adjustment is also consistent with a family systems perspective, as individual family members can be influenced by dynamics within each family subsystem and within the family system as a whole [21]. Thus, we focus on stepcouple, parent-child, and stepparent-child relationships in the current study.

When examining child adjustment, particularly in the context of family transitions, it is important to consider the sex, age, and developmental stage of the child [9]. Adolescence is a dynamic life phase in which key changes in physical, social, and emotional development occur [22]. Adolescence is also marked by ongoing social learning, the pursuit of greater autonomy, and sensitivity to social determinants of health [22, 23]. Thus, adolescence is a crucial developmental stage in the life course for which the study of familial environments and processes, and their influence on contemporaneous and subsequent adjustment, is warranted.

To date, much of the research focused on family structure and youth outcomes has been based on a between-group analytic approach by which children in non-nuclear families are contrasted with children in nuclear families across indicators of well-being. Although between-group analyses have helped identify possible adjustment differences among children in various family structures, scholars have advocated for within-group analyses, or a normative-adaptive approach, by which variation in child adjustment within a single family type is explored [24]. This approach is warranted on several fronts. For one, researchers have noted that adjustment outcomes vary substantially among youth in stepfamilies [25]. Moreover, identifying mechanisms that explain variation in child adjustment within a specific familial context (e.g., stepfamilies) has meaningful implications for policy-making, interventions, and prevention efforts aimed at supporting the adjustment of youth who experience particular family transitions.

Building on past research and theory, we sought to fill in notable gaps in the literature by (a) focusing specifically on a family context in which a sizable proportion of children in the United States will reside (i.e., stepfamilies), (b) examining several key dyadic relationships as antecedents to adolescent well-being in stepfamilies, (c) examining specific physical health symptoms as our key outcome of interest, and (d) using a longitudinal design, allowing us to control for prior levels of the outcome when modeling the influence of stepfamily relationships on adolescent physical health over time.

The following was our overarching research question: to what extent does stepfather-child, mother-child, and stepcouple relationship quality influence adolescent physical health concurrently and over time? We hypothesized that high-quality stepfather-child, mother-child, and stepcouple relationships would each be associated with fewer adolescent physical symptoms. We expected these associations to exist concurrently, yet, given the paucity of research in this area, we offer no explicit hypotheses about which relationships would exert influence on adolescent physical symptoms over time, net the influence of other relationships and after controlling for previous levels of physical symptoms. To assess the predictive validity of adolescent physical symptoms, we also examined the extent to which physical symptoms in adolescence predicted subsequent chronic-illness diagnoses later in young adulthood.

Methods

Data and Sample

Data come from Waves I, II, and IV of the National Longitudinal Study of Adolescent to Adult Health (Add Health), a school-based study with a nationally representative sample of adolescents in grades 7 through 12 during the 1994 to 1995 school year. In-home data were collected from a randomly selected subset of participants on school rosters, resulting in a total of 20,745 adolescents at Wave I. At Wave I, in-home parent interviews were also conducted. These parent data were also used in the current study as they contained socio-demographic data, as well as information pertaining to the stepcouple relationship. In-home data at Wave II were collected from those in grades 7–11 at Wave I between April and August of 1996, approximately one year after Wave I. Data at Wave IV were collected in 2008–2009 (ages 26 to 32).

Our analytical sample was limited to include only adolescents who reported living with their biological mother and stepfather (in both married and cohabiting stepfamilies) at Wave I. We focused on mother-stepfather families because nearly 80% of all stepfamilies are headed by a mother and stepfather [26], and Add Health contained relatively few father-stepmother families. The sample was further reduced to include only adolescents with valid sample weights for the combination of Waves I and II in order to produce nationally representative results [27]. The final analytical sample included 1,233 adolescents, with a mean age of 15.38 years ($SD = 1.63$). About 50% of adolescents were female; 60% identified as being White, 19% identified as being Black, 16% identified as being Hispanic, 3% identified as being Asian, and 2% identified as being part of another racial/ethnic group. The modal level of mother's education was some college (30%), followed by high school completion (28%), less than high school education (15%), and completion of a college degree (14%; about 13% of mothers did not indicate educational attainment). The average household income was \$48,960 ($SD = \$55,774$). The average number of relationships mothers' had during the past 18 years was 2.05 ($SD = .83$), and the average stepfamily duration was 7.04 years ($SD = 5.41$). The average number of individuals residing in the household was 3.95 ($SD = 1.50$).

Measures

Physical symptoms—Congruent with past research [16, 17], items for 10 physical symptoms were extracted from a general health questionnaire administered to youth. Youth were asked how often they had each of the following conditions in the past 12 months: headache, stomach ache, muscular pain, felt physically weak, felt hot all over for no reason, cold sweats, sore throat or cough, painful urination, dizziness, and chest pains. Response options ranged from 0 (“never”) to 4 (“every day”). Items from Wave II ($\alpha = .69$) were used to produce a latent construct for the key dependent variable, and items from Wave I ($\alpha = .70$) were used to produce a latent construct to assess the concurrent influence of stepfamily relationships as well as to control for the influence of Wave I physical symptoms on Wave II physical symptoms when assessing the influence of stepfamily relationships over time. Although the alpha values were minimally acceptable [28], we used an analytical approach designed to effectively handle measurement error.

Chronic illnesses—In order to assess the extent to which physical symptoms at Wave II predicted the reported diagnosis of various chronic illnesses (i.e., predictive validity), we used data from Wave IV that indexed the number of chronic illnesses participants had by young adulthood (2008 to 2009; ages 26–32). Participants indicated (i.e., Yes or No) if a healthcare provider had ever diagnosed them with any of the following 14 chronic illnesses: cancer/lymphoma/leukemia, high blood cholesterol/triglycerides/lipids, high blood pressure/hypertension, high blood sugar/diabetes, heart disease, asthma/chronic bronchitis/emphysema, migraine headaches, depression, post-traumatic stress disorder, anxiety/panic disorder, epilepsy/other seizure disorder. Items were summed into a count variable.

Stepfather-child relationship quality—Consistent with previous research [29, 30], stepfather-child relationship quality was a latent construct measured from the adolescents’ perspective with the following five items ($\alpha = .90$): “How close do you feel to your stepfather?” “How much do you think he cares about you?” “Most of the time, your stepfather is warm and loving toward you,” “You are satisfied with the way your father and you communicate with each other,” “Overall, you are satisfied with your relationship with your father.” All items were coded such that higher values indicated higher relationship quality. Response options ranged from 1 (“strongly disagree”/“not at all”) to 5 (“strongly agree”/“very much”).

Mother-child relationship quality—Mother-child relationship quality was a latent construct measured with the same five items as the stepparent-child relationship-quality construct, only items were worded to describe the mother-child relationship ($\alpha = .84$).

Stepcouple relationship quality—Stepcouple relationship quality was a latent construct measured with the following three observed indicators drawn from the in-home mother interview: the degree of relational happiness (rating from 1 to 10), whether the couple has talked about separation (1 = “No,” 0 = “Yes”), and a measure of how infrequently the couple fights (1 = “fight a lot,” 4 = “not at all”). Although the internal consistency reliability for stepcouple relationship quality was marginal due to disparate item scaling ($\alpha = .55$), the

three indicators loaded together well in the context of our measurement model (all loadings above .65). The Results section contains more details relating to the measurement model.

Covariates—The following covariates were included in the final model: adolescent gender, adolescent racial/ethnic identity, mother's education, household income, household composition, mother's relationships in past 18 years, biological father deceased, stepfamily duration, and whether the stepfamily remained intact at Wave II [17].

Analysis

We used structural equation modeling (SEM) in Mplus 7.0, which allowed us to model latent constructs and effectively handle measurement error [31]. We used a mean- and variance-adjusted weighted least squares estimator (WLSMV) and polychoric input matrix to account for ordinal and non-normal measures. Full information maximum likelihood was used to handle missing data. The following criteria were used to determine acceptable model fit: Comparative Fit Index (CFI) .95, Tucker-Lewis Index (TLI) .95; and root mean square error of approximation (RMSEA) and its upper bound 90% confidence interval .06 [32].

Our analytical model included latent constructs representing stepfather-child, mother-child, and stepcouple relationship quality at Wave I, latent constructs representing adolescent physical symptoms at Waves I and II, and model covariates. Thus, we were able to estimate concurrent associations between relationship-quality constructs and adolescent physical symptoms at Wave I, as well as associations between relationship-quality constructs and adolescent physical symptoms at Wave II, controlling for model covariates and adolescent physical symptoms at Wave I. This was a robust modeling technique, as we were able to assess change in adolescent physical symptoms over time by holding constant previous and stable patterns of adolescent physical health [33]. Stepfamily relationship constructs were also intercorrelated [29]. Preliminary calculations indicated that our model was sufficiently powered and over-identified [34]. We incorporated sampling weights and adjusted for potential in-school clustering. To link physical symptoms at Wave II with diagnosis of various chronic illnesses by Wave IV, we analyzed a zero-inflated negative binomial model with chronic illness as the dependent variable, and a composite scale for Wave II adolescent physical symptoms as the independent variable.

Results

Measurement Model

Table 1 displays results associated with our measurement model, which yielded acceptable fit: CFI = .97; TLI .96; RMSEA .03 (90% confidence interval: .02, .03). The model also yielded standardized factor loadings ranging from .82 to .92 for stepfather-child relationship quality, from .74 to .94 for mother-child relationship quality, from .65 to .88 for stepcouple relationship quality, from .36 to .71 for Wave I adolescent physical symptoms, and from .36 to .66 for Wave II adolescent physical symptoms. Inter-factor correlations are also reported in Table 1.

Structural Model

Figure 1 displays results associated with our final structural model. The model yielded acceptable model fit: CFI = .96; TLI .95; RMSEA .02 (90% confidence interval: .02, .02). In support of our hypotheses, stepfather-child and mother-child relationship quality were both negatively correlated with Wave I adolescent physical symptoms ($r = -.10$ and $r = -.13$, respectively). Stepcouple relationship quality was marginally and negatively correlated with Wave I adolescent physical symptoms ($r = -.09$, $p < .10$).

Only stepfather-child relationship quality was significantly associated with Wave II adolescent physical symptoms, net the influence of Wave I physical symptoms, the other relationship-quality constructs, and model covariates. Specifically, a one-standard deviation unit increase in stepfather-child relationship quality was associated with a .12 standard deviation decrease in adolescent physical symptoms at Wave II. The model explained 68% of the variance in Wave II adolescent physical symptoms, with 14% of the variance (or just over one-fifth of the total 68%) being attributable to the influence of the relationship-quality constructs.

In terms of covariates, youth identifying as Black reported lower levels of physical symptoms at Wave II compared to youth identifying as White. Female youth reported higher levels of physical symptoms at Wave II compared to male youth. Compared to mothers who completed some college, mothers who only completed high school had youth who reported slightly lower levels of physical symptoms at Wave II.

Ancillary Analysis

Results from our zero-inflated negative binomial model, which are reported in Table 2, indicated that Wave II adolescent physical symptoms were significantly associated with both the diagnosis of any chronic illnesses (versus none) and the number of diagnosed chronic illnesses by Wave IV. Specifically, a one-point increase in physical symptoms at Wave II was associated with an 88% decrease in the odds of having no diagnosed chronic illnesses in young adulthood ($b = -2.14$, $\exp[b] = .12$, $p < .05$). In others words, the higher the amount of adolescent physical symptoms at Wave II, the less likely the participant would be free of chronic illness by adulthood. Further, the expected number of diagnosed chronic illnesses by Wave IV increased by a factor of 1.62 for each additional unit increase in adolescent physical symptoms at Wave II ($b = .48$, $\exp[b] = 1.62$, $p < .001$). Thus, Wave II adolescent physical symptoms had predictive validity with respect to the reported diagnosis of chronic illnesses by young adulthood. Compared to the subsample omitted in the Wave IV analysis ($n = 238$) due to missing values, the remaining sample ($n = 955$) had a larger proportion of youth identifying as White (62% versus 49%), a smaller proportion of youth identifying as Latino (15% versus 24%), and more female youth (53% versus 37%).

Discussion

As we hypothesized, and consistent with a family systems perspective, higher levels of parent-child and stepcouple relationship quality were associated with reductions in concurrent levels of adolescent physical symptoms. Consistent with the well-documented

spillover hypothesis [35], shared variance between the relationship-quality constructs could yield indirect pathways of influence, such that stepcouple relationship quality likely influences adolescent health, concurrently and longitudinally, via the quality of parent-child relationships. Because the relationship-quality constructs in our study were measured concurrently, we chose not model such indirect pathways. We note this as a limitation, and suggest future research include measures of relationship quality at multiple time points, allowing for a cross-lagged modeling approach and the proper estimation of indirect effects.

In terms of change in physical symptoms over time, stepfather-child relationship quality yielded a significant and negative association with change in adolescent physical symptoms, net the influence of mother-child and stepcouple relationship quality, prior levels of adolescent physical symptoms, and model covariates. Our findings build on those by Bzostek [13] by illustrating a more robust association between stepfather-child relationship quality and youth physical health over time.

Because stepfather-child relationship quality remains significant over time, net the influence of stepcouple and mother-child relationship quality, stepfather-child relationship quality appears to be a robust social determinant of change in adolescent physical health in the context of mother-stepfather families. Stepparents represent novel additions to family systems, which may make them particularly influential in terms of stepfamily adjustment and the emotional security of children [18, 20]. Indeed, stepparents could have a unique role to play in promoting the health and adjustment of youth residing in stepfamilies. Specifically, stepparents can take on an “intimate outsider” role, marked by a unique ability to both connect meaningfully with youth while maintaining a sense of calm in the face of charged issues, such as youths’ career choices and sexual behavior [6]. Thus, high-quality stepfather-child relationships might be a valuable psychosocial resource for stepfamilies, allowing them to better combat the demands of stepfamily life and ultimately promote the health of adolescent stepchildren. Moreover, youth may benefit from the establishment of a warm and attentive stepfather-child relationship that is independent of other relationships. It is especially notable that stepparent-child relationship quality is associated with youths’ physical health, as most extant research has examined the emotional and behavioral health of youth in stepfamilies. Our findings suggest that stepfamily relationships might “get under the skin” to impact the physical health of youth [36].

Future research should explore adolescent physical health in the context of father-stepmother families and non-resident parent-child relationships. Also, researchers should explore the specific mechanisms that may underlie the association between stepfamily relationship quality and adolescent physical health. For one, the quality of stepfamily relationships may exert influence on adolescent physical health via intermediate risk behaviors (e.g., substance use, delinquency; [22]). Alternatively, the quality of stepfamily relationships may evoke within adolescents various biological and physiological response processes, such as change in cortisol levels and other immune-system components [37, 38], that lead to the manifestation of physical symptoms. Indeed, stress has been identified as a plausible mechanism by which family processes exert influence on youth outcomes [39]. Further still, the link between stepfamily relationship quality and adolescent physical health may represent somatization, with no clear or detectable mechanistic process [16]. Each of these

potential explanatory pathways could be subjected to empirical testing. The role of sociodemographic factors, such as youths' racial/ethnic identity or biological sex, and parents' educational attainment, could also be explored in greater depth moving forward.

Because it is increasingly likely that youth will reside in a stepfamily, the influence of stepfamily processes on youth adjustment is a valuable site for researchers and practitioners. We identified a link between stepfather-child relationship quality and change in adolescent physical health, with implications for the onset and number of diagnosed chronic illnesses by young adulthood. Efforts to explore the antecedents and correlates of high-quality stepparent-child relationship should be continued [40].

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Biography

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Implications and Contribution Statement

This longitudinal study examines stepfamily relationship quality as a predictor of adolescent physical health. Findings highlight stepfather-child relationship quality as a robust predictor of levels and change in adolescent physical symptoms over time, with implications for the emergence of chronic illnesses in young adulthood.

Figure 1.

Structural Equation Model of Wave II Adolescent Physical Symptoms Regressed on Wave I Stepfamily Relationship-Quality Constructs and Wave I Adolescent Physical Symptoms ($N = 1,233$)

Note: *** $p < .001$; ** $p < .01$; * $p < .05$; † $p < .10$. Final model fit indices: $\chi^2(921) = 1427.89$, $p < .001$; CFI = 0.956; TLI = 0.953; RMSEA = 0.021, 90% CI = [0.019, 0.023]. The WLSMV estimator and a polychoric correlation input matrix were used to handle non-normally distributed, ordinal observed indicators. Standardized parameters are in parentheses. Dashed lines indicate non-significant paths. Wave II physical symptoms were regressed on the following covariates: adolescent gender, adolescent racial/ethnic identity, mother's education, household income, household composition, mother's relationships in past 18 years, biological father deceased, stepfamily duration, and stepfamily intact at Wave II. Measurement components were removed to improve visual clarity.

Table 1Measurement Model Parameters ($N = 1,233$)

Construct		Factor Loadings	Factor Correlations			
			1	2	3	4
1	Stepfather-Child Relationship Quality					
	1	0.85				
	2	0.82				
	3	0.90				
	4	0.88				
	5	0.92				
2	Mother-Child Relationship Quality		0.59***			
	1	0.82				
	2	0.80				
	3	0.74				
	4	0.91				
	5	0.94				
3	Stepcouple Relationship Quality		0.31***	0.09 [‡]		
	1	0.88				
	2	0.78				
	3	0.65				
4	Wave I Adolescent Physical Symptoms		-0.11*	-0.16**	-0.10 [‡]	
	1	0.57				
	2	0.56				
	3	0.49				
	4	0.59				
	5	0.55				
	6	0.46				
	7	0.36				
	8	0.52				
	9	0.71				
	10	0.55				

Construct	Wave II Adolescent Physical Symptoms	Factor Loadings				Factor Correlations			
		1	2	3	4	1	2	3	4
5		−0.20***	−0.21***	−0.05	0.82***				
	1	0.60							
	2	0.55							
	3	0.40							
	4	0.66							
	5	0.60							
	6	0.52							
	7	0.36							
	8	0.51							
	9	0.65							
	10	0.56							

Note:

p .001;

**
p .01;

*
p .05;

†
p .10.

Final model fit indices: $\chi^2(485) = 915.72$, $p < .001$; CFI = 0.967; TLI = 0.964; RMSEA = 0.027, 90% CI = [0.024, 0.029]. The WLSMV estimator and a polychoric correlation input matrix were used to handle non-normally distributed, ordinal observed indicators. Item numbers for each construct appear in the order they are presented in the measurement descriptions. All factor loadings are standardized and significant at the $p < .001$ level.

Zero-Inflated Negative Binomial Model with Count of Wave IV Chronic-Illness Diagnoses Regressed on Wave II Physical Symptoms ($N = 995$)**Table 2**

Variable	b	S.E.	exp(b)
Wave IV: No Illnesses (zero part)			
Wave II Physical Symptoms	-2.14	1.06	0.12 [*]
Wave IV: Number of Chronic Illnesses (count part)			
Wave II Physical Symptoms	0.48	0.13	1.62 ^{***}

Note:

^{*} $p < .05$;^{***} $p < .001$.Results from the Vuong test supported the use of a zero-inflated model over a standard negative binomial model ($z = 1.61, p = .05$). *OR* = odds ratio; *IRR* = incidence rate ratio.