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Parent-Adolescent Dyads: Association of Parental Autonomy Support and Parent-Adolescent Shared Diabetes Care Responsibility

Kathleen M. Hanna, Ph.D., RN,
Indiana University School of Nursing

Carol J. Dashiff, Ph.D., RN,
University of Alabama at Birmingham School of Nursing

Timothy E. Stump, MA, and
Indiana University School of Medicine, Department of Biostatistics

Michael T. Weaver, Ph.D., RN
Indiana University School of Nursing

Abstract

Purpose—Parent-adolescent shared responsibility for diabetes care is advocated by experts to achieve beneficial diabetes and psychosocial outcomes for adolescents with type 1 diabetes. Parental autonomy support may be a way to facilitate this sharing. In this dyadic study, we examined parental diabetes-specific autonomy support experienced by adolescents with Type 1 diabetes and their parents (N = 89 dyads), and its association with their experience of shared diabetes care responsibility.

Methods—Path analysis was used to test an Actor-Partner Interdependence Model (APIM) for parental autonomy support effects on shared responsibility. This was a secondary analysis of data from 89 parent-early/mid-adolescent dyads.

Results—Actor effects were identified. Parents' and adolescents' perceptions of parental autonomy support were associated with their respective reports of shared diabetes care responsibility. One partner effect was identified. Adolescents' reports of parental autonomy support was associated with parents' reports of shared responsibility. Parents and adolescents held similar views of autonomy support but discrepant views of shared responsibility. Older adolescents perceived less parental autonomy support.

Conclusion—Increasing parental autonomy support may facilitate parent-adolescent sharing of diabetes care responsibility. Adolescent and parent perceptions influence each other and need to be considered when working with them to strengthen parental autonomy support.

Keywords

Adolescents; Parental Autonomy Support; Shared Responsibility; Diabetes

Transitioning diabetes care responsibility from parents to adolescents is challenging. However, during adolescence, diabetes management and metabolic control is poor and continued parental involvement is advocated (Silverstein et al., 2005). Desirable diabetes

and psychosocial outcomes occur when parents share responsibility or collaborate about diabetes care with their adolescents (Anderson et al., 1999; Helgeson et al., 2008; Vesco et al., 2010; Wysocki et al., 2009). Given the importance of shared responsibility, it is essential to identify processes that contribute to it. Further, it is important to address this during early and middle adolescence; late adolescents already dominate diabetes management (Schilling, Knafl, & Grey, 2006).

An important antecedent to sharing responsibility may be parental support for adolescents' autonomy development. Such support has been defined as being responsive to youths' perspectives and needs, providing choices, encouraging initiative, and reasoning about expectations or requirements (Lekes et al., 2010). Autonomy is a central developmental task during adolescence (Allen et al., 1999); it is foundational to diabetes self-care behaviors (Dashiff & Bartolucci, 2002; Hanna & Guthrie, 2003); and volitional autonomy (self-governance) is more optimal than independent functioning for youth in general (Soenens et al., 2007). Volitional autonomy is encouraged by parental autonomy support that minimizes control of the adolescent and encourages choice on the part of the adolescent (Soenens et al., 2007). Experts indicate this approach contributes to shared responsibility (Helgeson et al., 2008) and better metabolic control (Palmer et al., 2004). Parental autonomy support may be most salient during early and middle adolescence when dependencies on parents lessen (Steinberg & Silverberg, 1986).

However, the influence of parental autonomy support might depend on whose perceptions are being taken into account. Adolescents with diabetes and their parents have unique perspectives related to autonomy (Palmer et al., 2004; Ott et al., 2000; Butner et al., 2009), yet their perspectives are likely intertwined. This interplay between parent and adolescent is an excellent candidate for testing using a dyadic method referred to by Kenny, Kashy, and Cook (2006) as the Actor Partner Interactive Model (APIM). The APIM differentiates between actor (intrapersonal) and partner (interpersonal) effects through statistical methods, estimating these effects in tandem. In this study, relationships among variables within either the adolescent or within the parent are actor effects. Partner effects would consist of relationships between adolescent and parental variables. Four types of dyadic interrelationships have been identified (Kenny, Kashy & Cook, 2006): actor-oriented, partner-oriented, couple-oriented and social comparison.

An actor-oriented model has significant actor effects, but no partner effects. Actor-oriented models suggest that a person's outcome is determined by his or her own attributes and not the partner's attributes. In an actor-oriented model, for example, the adolescent's perception of shared responsibility would depend solely on the adolescent's perception of autonomy support, and not the parent's perception of autonomy support. Within an actor-oriented model, interventions to increase adolescent shared responsibility would focus solely on the adolescent's perception of autonomy support, as parental perception would not have an influence.

A partner-oriented model shows significant partner effects, but no actor effects, reflecting the influence of the partner's attributes as opposed to his or her own attributes. In a partner-oriented model the adolescent's perception of shared responsibility might, for example, depend solely on the parent's perception of autonomy support, and not the adolescent's perception of autonomy support. Within this partner-oriented model, interventions to increase adolescent shared responsibility would focus only on the parent's perception of autonomy support.

A couple-oriented model indicates that actor effects are just as important as the partner effects in explaining each person's outcome in the dyad. For example, the adolescent's

perception of shared responsibility would depend on both the adolescent's and the parent's perceptions of autonomy support. Within a couple-oriented model, interventions to increase adolescent shared responsibility would include both the parent's and adolescent's perceptions of autonomy support, as both have an influence.

A social comparison model maintains that the sum of the actor and partner effects cancel each other out. For example, if the adolescent's perception of shared responsibility depended on both the adolescent's and the parent's perceptions of autonomy support, but the influence of parental perception of autonomy support was of similar strength but opposite direction to the influence of adolescent perception of autonomy support. Within a social comparison model, interventions to increase adolescent shared responsibility would need to take into consideration the opposite effects of parent and adolescent perception of autonomy support, so that parental perceptions do not negate any gains that might result from attempts to alter adolescent perception.

Thus, we tested interdependent associations of parents' and adolescents' perceptions of parental diabetes-specific autonomy support on their own and the other's perceptions of shared diabetes care responsibility during early and middle adolescence (see Figure 1). We proposed direct effects of parental support on shared responsibility and direct effects of age on parental support and shared responsibility. The hypotheses were:

1. Each partner's perception of parental autonomy support will have direct effects on his or her own perception of shared responsibility (actor effect), as well as the other's perception of shared responsibility (partner effect).
2. Adolescent age will exhibit direct effects on parental autonomy support as reported by parents and adolescents.
3. Adolescent age will exhibit direct and indirect effects on shared responsibility as reported by parents and by adolescents.

Methods

This is a secondary analysis of parent-adolescent dyad data collected to test the psychometric properties of parent and adolescent scales (Hanna, Dimeglio, Fortenberry, 2005; Hanna, Dimeglio, Fortenberry, 2007). The APIM (Cook & Kenny, 2005) was used to model and test the interdependent influences of parental autonomy support on shared responsibility as reported by adolescents with type 1 diabetes and their parents.

Participants and Procedures

Adolescents and their parents were approached at diabetes clinic affiliated with a regional university medical center. Eligible adolescents in the primary study were: 12 to 18 years of age; diagnosed with type 1 diabetes prior to 10 years of age, and for at least one year; able to speak and read English; enrolled in the same grade in school as others his/her age (to exclude any with intellectual disabilities that would interfere with autonomy); and without any serious diabetes complications or obvious mental or physical health problems that would interfere with diabetes management. An additional requirement was participation of the parent primarily involved in diabetes management. Either the mother or father was included because the parent primarily involved is the most salient for influencing diabetes outcomes (Wysocki, et al., 2009). The parent needed to be able to speak and read English and to be living with the adolescent. Out of the 153 eligible pairs, 105 (67%) voluntarily consented; 5 did not complete the questionnaires; and 11 dyads were eliminated because this analysis focused upon early and middle adolescence (12 through 17 years olds). The study

received approval by the University's Institutional Review Board and appropriate consents/assents were obtained from parents and adolescents.

Measures

Parents and adolescents completed parallel versions of parental autonomy support and diabetes responsibility scales. Adolescent age, date of diagnosis and duration of diabetes, and metabolic control (hemoglobin A1C) were obtained from medical charts.

Parental Autonomy Support was measured by the 4-item Parental Support for Adolescents' Autonomy Development scale (Hanna, DMmeglio, Fortenberry, 2005). This scale assesses enactment of as well as preceived helpfulness of parental behaviors that encourage autonomy (volitional in nature), that is behaviors minimizing control of adolescents and encouraging choice on the part of adolescents. Items addressed insulin management and involved parents asking for adolescents' input, answering questions, showing ways to calculate dose and making suggestions about giving insulin. Although items were around one domain of the diabetes regimen, a greater universe of items reflecting diverse diabetes tasks were subjected to factor analysis. Adolescents and parents were asked to note both the frequency of behavior (*none of the time* (0) to *all of the time* (4)) and helpfulness of behavior (*not at all helpful* (0) to *very helpful* (4)). Because it is important if the behavior occurred as well as if was perceived as helpful, frequency rating by helpfulness rating was multiplied and then summed, providing an overall score (range from 0 – 64). If the behavior did not occur or was not at all helpful, a value of 0 could be obtained. Higher values indicated a greater degree of occurrence and helpfulness of the behavior. The sample for this study was sub-setted from the psychometric testing sample where the developers documented construct validity, concurrent validity, and internal consistency reliability. Cronbach alpha values were 0.80 and 0.78 for adolescents and parents, respectively.

Parent-Adolescent Shared Diabetes Responsibility was measured by the 15-item Responsibility Subscale (M. Peyrot, unpubl. observ), assessing adolescents' and parents' role in diabetes tasks. The instructions were revised to be inclusive of administration of insulin via pump or injections. Adolescents and parents were asked to note on a scale of 1 to 5 how diabetes tasks are handled from adolescent all the time to parent all the time with a middle response of 3 for parent half and adolescent half. Because our interest was in shared responsibility, these responses were recoded. A value of 2 was given to responses indicating parent half and adolescent half, representing the highest level of sharing. In contrast, a value of 0 was given to responses of either adolescent or parent all of the time indicating the absence of sharing. A value of 1 was given to responses in between the above (those not sharing half and half and neither parent or adolescents all the time). Items were then summed to create the total sharing of responsibility score. Cronbach alpha coefficients were .82 for adolescents and .81 for parents in the full sample from which this subset was derived.

Data Analysis

Path analyses, a special case of structural equation modeling (SEM) wherein all variables are observed and no latent variables are estimated, were used to test those inter- and intra-individual effects. Mplus software (Muthen & Muthen, 1998–2007) was used to evaluate observations for influence and outlying, test model goodness of fit, and simultaneously estimate path coefficients from multiple equations using MLR (robust maximum likelihood) estimation. The covariance matrix based on all available data (i.e., list-wise deletion was off) was used to estimate the path model. All analyses used the parent-adolescent dyad as the unit of analysis. Interdependence within the dyad was modeled by specifying correlated error terms between parent and adolescent versions of autonomy support and shared responsibility. Model goodness of fit was evaluated using the chi-square test and three fit

indices, namely the comparative fit index (CFI), root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR). Acceptable fit was defined as: CFI > 0.95, RMSEA < 0.06, and SRMR < 0.08 (Hu & Bentler, 1999). Cook's distance (Cook, 1997), log-likelihood influence, and Mahalanobis distance (Cook & Weisberg, 1982) were used to identify influential observations. Paired *t* tests were used to test agreement between adolescents and parents. Statistical significance was defined as $p < .05$ for all inferential tests.

Two dyads were identified as influential outliers based on influence measures available in MPlus (Muthén & Muthén, 1998–2007). Observations exceeding three standard deviations above the mean for one or more of the influence measures were considered to be influential outliers. Specifically, those two dyads exceeded 3.4 standard deviations above the sample mean values for Cook's distance, 5.8 standard deviations for log likelihood influence, and 3.8 standard deviations for Mahalanobis distance. Those two dyads were found to be inconsistent in their pattern of shared responsibility and parental support for autonomy development compared to the rest of the dyads, leading to their undue influence on parameter estimates. Therefore, those two dyads were not included in estimating the final model. Parameter estimates were therefore based on 87 parent-adolescent dyads (93%). Most dyads (84%) had complete data, and only one dyad had as many as two missing values.

Results

Sample Characteristics

Characteristics of the final sample are delineated in Table 1. Adolescents were on average 14.5 years old ($SD = 1.4$), had a hemoglobin A1c of 9.14% ($SD = 1.6$), and had been diagnosed with diabetes for 5.2 years ($SD = 3.3$). Most were White (91%), male (60%) and living with two parents (67%). Parents were, on average, 40.6 years old ($SD = 1.4$) and tended to be well-educated (49% with some college) and mothers (80%).

Parent-Adolescent Agreement

Adolescents reported a level of parental support similar to what parents reported for themselves ($M = 30.4$, $SD = 19.4$ vs. 26.1 , $SD = 17.2$; $p = .054$). However, adolescents reported less shared responsibility than parents ($M = 10.0$, $SD = 4.7$ vs. 13.3 , $SD = 4.2$; $p < .001$).

Testing of Predictive Model

Table 2 presents the augmented correlation matrix utilized for the APIM path analysis. Figure 1 shows unstandardized path coefficients for the fitted parent-adolescent dyad model. Since the model was saturated, overall fit was perfect (chi square = 0, $df = 0$, $p = 1.0$; CFI = 1.0, RMSEA = 0; SRMR = 0). Significant actor (adolescent on adolescent or parent on parent) direct effects were observed for parental autonomy support on shared responsibility for both parents ($\beta_{31} = .077$, $p = .008$) and adolescents ($\beta_{42} = .102$, $p = .002$). Higher levels of parental autonomy support were associated with higher levels of shared responsibility for both parents and adolescents. Only one partner effect (adolescent on parent or parent on adolescent) was statistically significant. There was a direct effect for adolescents' report of parental autonomy support on parents' report of shared responsibility ($\beta_{32} = 0.056$, $p = 0.047$). Age of adolescent exhibited statistically significant negative direct effects on adolescent perception of parental autonomy support ($\gamma_{21} = -5.927$, $p < .001$); this indicates that older adolescents perceived less parental autonomy support. In contrast, there was no statistically significant direct effect for adolescent age on parental perception of autonomy support ($\gamma_{11} = -2.098$, $p = .111$).

Indirect (IE) and total effects (TE) implied by the model were also investigated. The total IE encompassing all indirect paths from age of adolescent to parental perception of shared responsibility was statistically significant and negative ($IE = -0.492, p = .017$). However, neither of the individual IE for adolescent age mediated through (a) parental perception of autonomy support nor (b) adolescent perception of autonomy support on parental perception of shared responsibility were statistically significant. This indicates that the overall mediated influence of adolescent age tends to produce lower parental perceptions of shared responsibility.

The total IE encompassing all indirect paths from age of adolescent to adolescent perception of shared responsibility was statistically significant and negative ($IE = -0.674, p = .004$). One of the two individual IE involved (age of adolescent mediated through adolescent report of autonomy support and adolescent report of shared responsibility) was statistically significant ($IE = -0.605; p = 0.011$). This indicates that the overall mediated influence of adolescent age tends to produce lower perceptions of shared responsibility in the adolescent.

The TE for all paths from age of adolescent to parental report of shared responsibility was negative and significant ($TE = -0.736, p = .014$). This indicates that, overall, as adolescents get older, parents tend to report lower levels of shared responsibility. On the other hand, the TE for all paths from age of adolescent to adolescent report of shared responsibility, while negative, was not statistically significant ($TE = -0.593, p = .110$). This indicates that, overall, as adolescents get older, their perception of shared responsibility tends not to change.

Discussion

These findings suggest that parental autonomy support is associated with shared responsibility. This is consistent with evidence that parental autonomy support is important for positive outcomes among youth in general (Beveridge & Berg, 2007; Soenens et al., 2007). Because shared responsibility is recognized as the optimal approach among early and middle adolescents with diabetes (Anderson, et al., 1999; Helgeson, et al., 2008), it is important to identify factors that are associated with it. Although actor and partner “effects” are used in the APIM, causal relationships between parental autonomy support and shared responsibility cannot be established in this cross-sectional study.

Actor effects were supported and congruent between partners. When parents perceived themselves to be more autonomy supportive of their adolescent, they also perceived themselves to engage in more sharing of these diabetes tasks with adolescents. Likewise, when adolescents perceived their parents to be supportive of their autonomy, they also perceived more responsibility sharing with the parent. Thus, findings suggest that the individual’s perceptions, either the parent or the adolescent, are important to consider.

One partner effect was identified. Adolescents’ perceptions of their parents’ autonomy support was associated with parents’ perceptions of sharing responsibility with adolescents. This suggests a couple-oriented model wherein consideration of perceptions of both parents and adolescents would be important when intervening around autonomy support and responsibility sharing. Such enhancement of perceptions of both parties in the dyad may mitigate against premature disengagement of adolescents and parents from the process of sharing. Masche (2010) suggests balancing of engagement by respecting adolescents’ autonomy is important for healthy family functioning.

It is noteworthy that adolescents’ and parents’ views of responsibility sharing were discrepant, while views of parental autonomy support were similar. Discrepant views about sharing, i.e. adolescents perceived less sharing than parents, may reflect adolescents’

striving for autonomy. This may be considered normative during middle adolescence (Butner et. al., 2009). This is consistent with other findings where adolescents and parents hold unique perspectives related to autonomy (Palmer et al., 2004; Ott et al., 2000; Butner et al., 2009). The similar views of adolescents and parents regarding parental autonomy support may be a point of connection for parents and their adolescents.

Adolescent age was shown to have a complex relationship with adolescents' and parents' perspective of parental autonomy support. Adolescents' perceptions of autonomy support from parents declined with age while parental perceptions were not associated with age. This suggests that autonomy support might be a greater concern of adolescents than parents. George and Solomon (1999) posit that exploration and autonomy seeking are highly salient to adolescents, whereas parents are more likely to be preoccupied with issues of connectedness. It is just as likely that adolescents perceive such support as declining; they are out of the home more and interacting more with their peers, a source of support for adolescents with diabetes (Bearman & LaGreca, 2002).

Parental perceptions of shared responsibility declined with advancing adolescent age, though age was not associated with adolescents' perceptions of sharing. The decline of parental perceptions of shared responsibility with age is in contrast with Beveridge's (2006) finding that mothers of 10–15 year olds viewed diabetes care as shared as adolescence progressed. Parents' report declines in responsibility sharing could be due to the shifting of responsibility from parents to adolescents seen with increasing age of adolescents (Ingerski et al., 2010; Schilling et al., 2006). The lack of association of adolescents' perception of sharing with age is in contrast with Beveridge's (2006) finding that adolescents shifted their perceptions from shared toward more adolescent responsibility.

This study has some limitations. Findings may be generalized to similar populations, that is, White adolescents from two-parent families and with suboptimal metabolic control, common in this age group (Silverstein et al., 2005). This cross-sectional study limits causal attribution among the variables, and it is premature to implement parental autonomy support interventions to affect shared responsibility. The relatively small sample size and secondary data set limited inclusion of other influential variables in the analysis.

Longitudinal research with a larger sample is advocated. Such studies could incorporate other important variables such as diabetes management. Perceptions of sharing by adolescents has been associated with diabetes management among adolescents (Vesco et al., 2010). A longitudinal design would allow examination of causal relationships, and disentangle the direction of effects, i.e. whether parental autonomy support influences responsibility sharing or sharing influences autonomy support.

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Key Messages

- An autonomy supportive approach by parents around diabetes care may be integral to adolescents' acceptance of parent-adolescent sharing of diabetes tasks.
- Early and middle adolescents have similar perceptions of parents' autonomy support.
- Different perceptions between parent and adolescent about sharing diabetes responsibility exist during early and middle adolescence.
- Parental perceptions of shared responsibility decline with age. This could be problematic if this results in parents' premature withdrawal of collaboration with their adolescents.
- Perceptions of both parents and adolescents are important when working with this age group.

Figure 1.
Model Results: Association of Parental Autonomy Support, Parent-Adolescent Shared Responsibility and Adolescents' Age
p-values *p .05; **p .01; ***p .001

Table 1

Characteristics of Parent and Adolescent Participants

Characteristics	Parents	Adolescents
Gender	<i>N</i> = 87	<i>N</i> = 87
Female	80.5%	40.2%
Male	19.5%	59.8%
Race	<i>N</i> = 86	<i>N</i> = 86
White	93.0%	90.7%
Black	5.8%	5.8%
Other	1.2%	3.5%
Marital Status	<i>N</i> = 87	
Married	69.0%	
Divorced/separated	25.3%	
Other	5.7%	
Education	<i>N</i> = 87	
11 years or less	3.4%	
12 years or high school	47.2%	
Beyond high school	49.4%	
Living Situation		<i>N</i> = 87
Only mother or only father		12.6%
Both mother/father in same house		66.7%
Father and step-mother		1.2%
Mother and step-father		12.6%
Other		6.9%
Insulin Administration		<i>N</i> = 86
Injection		74.4%
Pump		25.6%

Table 2

Augmented Correlation Matrix.

Measure	1	2	3	4	5
1. PPSR	1.00				
2. APSR	.407	1.00			
3. PPSAD	.445	.308	1.00		
4. APSAD	.434	.462	.461	1.00	
5. Age	-.242	-.174	-.170	-.426	1.00
Mean	13.31	10.01	25.80	29.74	14.52
Variance	17.10	21.51	283.34	258.22	1.85

Note. PPSR = Parental Perception Shared Responsibility; APSR = Adolescent Perception Shared Responsibility; PPSAD = Parental Perception Support for Autonomy Development; APSAD = Adolescent Perception Support for Autonomy Development; Age is of adolescents.