

PEDIATRICS®

OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

Youth in Foster Care With Adult Mentors During Adolescence Have Improved Adult Outcomes

Kym R. Ahrens, David Lane DuBois, Laura P. Richardson, Ming-Yu Fan and Paula Lozano

Pediatrics published online Jan 8, 2008;

DOI: 10.1542/peds.2007-0508

The online version of this article, along with updated information and services, is located on the World Wide Web at:

<http://www.pediatrics.org/cgi/content/full/peds.2007-0508v1>

PEDIATRICS is the official journal of the American Academy of Pediatrics. A monthly publication, it has been published continuously since 1948. PEDIATRICS is owned, published, and trademarked by the American Academy of Pediatrics, 141 Northwest Point Boulevard, Elk Grove Village, Illinois, 60007. Copyright © 2008 by the American Academy of Pediatrics. All rights reserved. Print ISSN: 0031-4005. Online ISSN: 1098-4275.

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™



Youth in Foster Care With Adult Mentors During Adolescence Have Improved Adult Outcomes

Kym R. Ahrens, MD, MPH^a, David Lane DuBois, PhD^b, Laura P. Richardson, MD, MPH^a, Ming-Yu Fan, PhD^c, Paula Lozano, MD, MPH^a

Departments of ^aPediatrics and ^cPsychiatry, University of Washington, Seattle, Washington; ^bInstitute for Health Research and Policy, University of Illinois, Chicago, Illinois

The authors have indicated they have no financial relationships relevant to this article to disclose.

ABSTRACT

OBJECTIVE. The goal of this study was to determine whether youth in foster care with natural mentors during adolescence have improved young adult outcomes.

METHODS. We used data from waves I to III of the National Longitudinal Study of Adolescent Health (1994–2002). Individuals who reported that they had ever been in foster care at wave III were included. Youth were considered mentored when they reported the presence of a nonparental adult mentor in their life after they were 14 years of age and reported that the relationship began before 18 years of age and had lasted for at least 2 years. Outcomes were assessed at wave III and included measures of education/employment, psychological well-being, physical health, and participation in unhealthy behaviors as well as a summary measure representing the total number of positive outcomes.

RESULTS. A total of 310 youth met the inclusion criteria; 160 youth were mentored, and 150 youth were nonmentored. Demographic characteristics were similar for mentored and nonmentored youth. Mentored youth were more likely to report favorable overall health and were less likely to report suicidal ideation, having received a diagnosis of a sexually transmitted infection, and having hurt someone in a fight in the past year. There was also a borderline significant trend toward more participation in higher education among mentored youth. On the summary measure, mentored youth had, on average, a significantly greater number of positive outcomes than nonmentored youth.

CONCLUSIONS. Mentoring relationships are associated with positive adjustment during the transition to adulthood for youth in foster care. Strategies to support natural mentoring relationships for this population should be developed and evaluated.

www.pediatrics.org/cgi/doi/10.1542/peds.2007-0508

doi:10.1542/peds.2007-0508

Key Words

adolescence, foster care

Abbreviations

YFC—youth in foster care

Add Health—National Longitudinal Study of Adolescent Health

CES-D—Center for Epidemiologic Studies Depression

STI—sexually transmitted infection

PAR—population attributable risk

Accepted for publication Jun 20, 2007

Address correspondence to Kym R. Ahrens, MD, MPH, Department of Pediatrics, University of Washington, Box 354920, Seattle, WA 98195-4920. E-mail: kahrens@u.washington.edu

PEDIATRICS (ISSN Numbers: Print, 0031-4005; Online, 1098-4275). Copyright © 2008 by the American Academy of Pediatrics

MENTORING RELATIONSHIPS WITH nonparental adults have been shown to have positive effects on adolescents. This seems to be true regardless of whether mentorship occurs naturally (ie, when youth develop relationships from their own lives)^{1–3} or in the context of a program such as Big Brothers Big Sisters.⁴ Less is known regarding the impact of mentoring relationships on at-risk youth. Youth in foster care (YFC) are at increased risk for poor adult outcomes in numerous domains, including mental and physical health,^{5,6} delinquent and risky behavior,⁶ educational attainment,^{6–10} and employment.^{6,8–10}

There is interest in both the public and private sectors in mentoring programs for YFC.^{11,12} Despite a call for research on this topic from both the foster care and mentorship fields,^{13,14} only limited research is available to inform these efforts. The few relevant studies have focused on programmatic mentoring relationships with assigned volunteers and reported mixed results.^{15,16} Of note, at-risk youth seem vulnerable to negative outcomes when mentoring relationships are disrupted within the first 6 months.¹⁷ It is hypothesized that YFC who are paired with volunteer mentors through programs may be especially susceptible to such adverse effects as a result of histories of tenuous and disrupted attachments with parents or other caregiving figures.¹⁵ Mentoring relationships that are developed informally with nonparental adults who are already part of their lives may be more enduring and thus have greater potential for positive impact; however, no studies have evaluated the effects of naturally occurring mentoring relationships for YFC. In addition, studies of programmatic mentoring have focused on short-term outcomes.⁴ Given the

nature of behavior change and the complexity of the lives of YFC, the impact of mentoring relationships for this population in the short-term may be quite different from when outcomes are measured at a later point. In this investigation, we used data from a large longitudinal study to examine whether YFC with natural mentoring relationships during adolescence have better early adult outcomes than those without mentors.

METHODS

Study Design

This was a longitudinal cohort study that used data from the National Longitudinal Study of Adolescent Health (Add Health), a large, nationally representative sample with 3 waves of data collected over 6 years.¹⁸ Wave I, stage 1 consisted of a staff-administered questionnaire in schools when youth were in 7th to 12th grades ($N = 90\ 118$). Computer-assisted face-to-face interviews with trained interviewers were used for wave I, stage 2; wave II; and wave III at ~1, 2, and 6 years from the start of the study ($N = 20\ 745$, $14\ 738$, and $15\ 197$, respectively).

Sample

Youth were included in this study when they had a valid survey weight (see "Analyses"), reported that they had been in foster care, and answered a series of questions regarding mentorship (assessed at wave III; $N = 310$). The median number of foster care placements reported by youth was 1 (mean: 1.68; range: 1–10; 3 were unsure of the total number). Data on the length or timing of placements were not collected in the Add Health study.

Definitions

Mentorship

As in a previous study on the general sample of Add Health,² the presence or absence of a mentor was determined on the basis of a single retrospective question from wave III. This question asked respondents whether a nonparental adult had made an "important positive difference in your life since you were 14 years old." Participants were categorized as being "mentored" during adolescence only when the relationship was reported to have first become important before 18 years of age. Participants who reported younger siblings or spouses as their mentors were excluded from the "mentored" category, because these relationships are typically not considered mentoring relationships in the literature.^{19,20} Finally, we restricted our definition of mentored adolescents to those who reported a relationship of at least 2 years in duration. We selected this length because it was associated with improved outcomes in another population of high-risk adolescents (adolescent parents)¹⁹ and because it was a cutoff point that did not greatly change the relative proportions of different types of mentors reported by youth, such as relatives, professionals (eg, teachers, therapists, social workers), and adults in more informal roles (eg, parent of a friend, coach). All participants who answered yes to the initial mentorship question but did not fit these criteria were considered nonmentored for the main anal-

yses. These participants are subsequently referred to as "partially mentored."

Outcomes

Using data available at wave III, we examined early adulthood outcomes in 4 domains: education/employment, psychological well-being, physical health, and participation in unhealthy behaviors. Within each category, we identified a primary outcome that had a particularly strong empirical or theoretical association with long-term positive adult functioning as well as selected secondary outcomes.²¹

Education/Employment

Our primary outcome for this category was participation in higher education (yes/no; defined as current enrollment in a 2- or 4-year college program, previous higher education degree, or previous or current enrollment in a vocational program of at least 3 months' duration). Secondary outcomes included completion of high school (yes/no) and a combined outcome of working ≥ 10 hours per week and/or currently being in any type of school (yes/no).

Psychological Well-being

The primary outcome for this category was an index of self-esteem previously used in the general population study (average of 4 items on a 5-point scale; coefficient $\alpha = .73$; dichotomized at median).² Secondary outcomes included a depression scale (average of 9 items from the Center for Epidemiologic Studies Depression [CES-D] scale²²; $\alpha = .80$; dichotomized at median) and a question regarding suicidal ideation within the past year (yes/no). Although the specific version of the CES-D included in Add Health apparently has not been the focus of validation research, other, shortened versions of the measure with as few as 9 items have been found to perform similarly to the full CES-D.²³ In addition, the measures of self-esteem and depression were negatively associated at wave III ($r = -0.40$), as would be expected.

Physical Health

The primary outcome for this category was perceived general health (5-point scale; dichotomized between excellent/very good and good/fair/poor). Secondary outcomes included the level of physical activity in the past week (average of 7 questions; $\alpha = .66$; dichotomized at median), BMI (calculated from self-report of height and weight; dichotomized at a BMI of 25), and self-report of having received a diagnosis of a sexually transmitted infection (STI) within the past year (yes/no).

Participation in Unhealthy Behaviors

The primary outcome was a measure of drug use in the past year (yes/no). Alcohol and marijuana use were excluded because large proportions of the sample reported binge drinking and/or smoking pot (51% and 38%, respectively), thus suggesting that these behaviors were normative. Secondary outcomes included self-reports of ever belonging to a gang (yes/no), hurting someone in a physical fight in the past year (yes/no), arrest after 18 years of age (yes/no), and regular/current

smoking (yes/no; defined as any participant who reported a history of regular smoking at any time and having had smoked at all in the past month).

Summary Measure

To assess youths' overall functioning during early adulthood, we computed a summary measure that represented the total number of the 15 outcome measures on which the youth reported a favorable outcome (eg, participation in higher education, absence of suicidal ideation). Scores on this index were prorated to adjust for outcomes with missing data.

General Covariates

General covariates included gender, race, ethnicity, parental education level, parental income level, and average neighborhood household income level because these had the potential to influence both mentored status and adult outcomes. Measures of youths' relationships with their parents and peers have been associated with their propensity to report natural mentoring relationships²⁰ and/or the degree to which they benefit from mentoring.^{4,24,25} We included 2 measures of these relationships from wave I, stage 1 in all analyses. One measure assessed the self-reported quality of the mother-child relationship and consisted of an average of 5 items ($\alpha = .86$). An example question item is, "How close do you feel to your mother?" The second measure assessed peer connectedness and consisted of 1 question relating to the youth's self-perceived relationships with peers: "How much do you feel that your friends care about you?"

Baseline Functioning

For each outcome, we also controlled for baseline (wave I, stage 1) status when available. For the psychological well-being category, we used identical baseline measures of self-esteem, depression, and suicidal ideation for the corresponding wave III measure. For the physical health category, we used identical measures of perceived general health and self-reported BMI. The baseline measure for the physical activity outcome was an average of 4 questions regarding various types of physical activity that were similar but not identical to those asked at wave III. A self-report of whether the participant had ever been sexually active was used as the baseline measure for the STI outcome. For education/employment outcomes, we included the participant's average self-reported grades at wave I. One exception is that we did not include a baseline status covariate in the analysis of working ≥ 10 hours per week or current enrollment in school, because we did not believe that there was an adequate baseline variable for this analysis. Finally, for participation in unhealthy behaviors, baseline measures included report of drug use ever for the "drug use in the past year" outcome (alcohol and marijuana were also excluded from the control measure), a delinquency scale (average of 15 items regarding violent and nonviolent delinquent behaviors) for the "belonging to a gang" and "hurting someone in a physical fight" outcomes, and self-report of whether participants had ever tried smoking for the "regular/current smoking" outcome. Most

continuous and categorical baseline measures were left in their original forms (ie, were not dichotomized); however, because regression models were found to be unstable when certain scaled covariates were entered as categorical variables, we dichotomized in the following manner: measure of peer connectedness—median and perceived general health—between excellent/very good and good/fair/poor. For the summary measure, an index of the number of favorable outcomes reported by the youth at wave I, stage 1 was computed in the same manner as at wave III and was based on the 11 baseline measures.

Open-Ended Mentorship Question

Each youth who answered "yes" to the initial mentoring question was asked to answer an open-ended question about how his or her mentor had been helpful. On the basis of a previous study,²⁶ we coded statements into the following categories for all youth who met our criteria for being mentored: guidance/advice ("gave good advice"), emotional support ("he made me feel loved"), role modeling ("set an example for me"), and tangible/instrumental support ("he helped me get my GED"). We also added an additional category, serving as a parental figure, because of its specific relevance to this population ("she was always there for me when my mother wasn't"). The categories were not mutually exclusive. Two of the researchers independently coded all of the statements (κ coefficient of agreement ranging from 0.61 to 0.87 for the 5 categories), and differences were resolved through discussion.

Analysis

Stata SE 9 (Stata Corp, College Station, TX) was used for all analyses. The ICE²⁷ multiple-imputation program with predictive matching was used to impute missing data for all variables except the following: the question that was used to identify the foster care population itself and the questions that were used to determine mentored status, race and ethnicity variables, BMI variables at both baseline and wave III, and the arrest variable. These variables were determined to be inappropriate for imputation because of the type of data that they contained and/or the role that they played in our analysis (eg, we believed that it was inappropriate to impute the variable by which we defined our population). The current work or school variable was added as a secondary outcome subsequent to the multiple imputation. Although this did not affect the main analyses, it did reduce slightly the number of participants who were included in our general population descriptive statistics (see "Results").

After the imputation procedure, descriptive statistics comparing YFC with youth in the general population as well as mentored and nonmentored YFC were computed for all variables described previously. For mentored youth, descriptive statistics were also computed for variables to assess the length of the relationship, the source of the mentor in the youth's life, and the role(s) that the mentors played in the youth's lives on the basis of the coding of responses to the open-ended question described previously. Multiple logistic regres-

TABLE 1 Characteristics of YFC, Mentored and Nonmentored at Wave I, Stage 1

Characteristic	All YFC (N = 310)	Mentored YFC (n = 160; 47%) ^a	Nonmentored YFC (n = 150; 53%) ^a
Gender, % female	57	62	53
Age, mean (SE)	16.0 (0.20)	16.0 (0.24)	16.1 (0.32)
Parental income, mean (SE), \$1000s	27 (2.6)	26 (3.1)	28 (3.4)
Parental education, % complete			
High school diploma or less	62	58	64
Any college	38	42	36
Neighborhood household income, mean (SE), \$1000s	26 (1.7)	27 (2.8)	24 (1.5)
Race ^{b,c}			
White	65	68	63
Black	23	22	21
Native American	5	3	6
Asian	4	1	6
Other	4	5	3
Ethnicity, % Hispanic	11	10	12
Mother-child relationship (1–5), mean (SE)	4.2 (0.08)	4.3 (0.11)	4.2 (0.10)
Peer connectedness (1–5), mean (SE)	4.3 (0.08)	4.2 (0.11)	4.3 (0.10)
Baseline measures for outcomes			
Average grades (1–4), mean (SE)	2.5 (0.08)	2.4 (0.10)	2.5 (0.13)
Self-esteem (1–5), mean (SE)	4.0 (0.07)	4.0 (0.08)	3.9 (0.10)
Depression (0–3), mean (SE)	0.9 (0.04)	0.8 (0.06)	1.0 (0.07)
Suicidal ideation, %	25	25	25
General health (1–5), mean (SE)	3.7 (0.08)	3.7 (0.11)	3.8 (0.11)
Physical activity (0–3), mean (SE)	1.3 (0.05)	1.2 (0.09)	1.3 (0.06)
BMI, kg/m ² , mean (SE) ^d	22.4 (0.38)	22.8 (0.47)	22.0 (0.60)
Sexual activity ever, %	52	52	51
Drug use ever, %	24	25	23
Delinquency (0–3), mean (SE)	0.4 (0.03)	0.4 (0.05)	0.4 (0.05)
Smoking ever, %	72	73	70

No significant differences exist between mentored and nonmentored YFC ($P > .10$).

^a n for mentored and nonmentored YFC do not match percentages because of design correction procedures.

^b Total percentage for all racial categories for all YFC, mentored YFC, and nonmentored YFC do not add to 100 because of rounding.

^c $N = 309$ because of exclusion from imputation.

^d $N = 304$ because of exclusion from imputation.

sions were performed to determine whether the presence of a natural mentor was associated with each outcome after taking into account the contributions of baseline covariates. For the 2 educational outcomes (participation in higher education and completion of high school), 4 participants who indicated that they were still in high school were excluded from the analysis. Linear or polychotomous logistic regressions were performed on any outcomes that were originally continuous or ordinal, respectively, to determine whether results changed when the full complement of the data was used. Any discrepancies between logistic and linear/polychotomous logistic regressions are reported. For each outcome with a significant association with mentoring in the regression analyses, Poisson regressions were conducted to obtain the relative risk and, in turn, derive the population attributable risk (PAR) of the outcome from mentoring.²⁸ All covariates that were included in the original regressions were included in these analyses.

For the summary measure, a multiple linear regression was run. For this analysis, all negative outcomes were coded in a positive direction, and participants who had not yet completed high school were excluded because of their exclusion from the 2 individual education-related out-

comes. Linear or scaled baseline measures that were not dichotomized in the analyses of individual outcomes were dichotomized for the purposes of computing the summary measure at baseline. These measures all were dichotomized in the same manner as the corresponding wave III outcome except for the following variables: average grades (dichotomized at median) and BMI (dichotomized at the age-specific, gender-specific 85th percentile).

Finally, sensitivity analyses were run using the same regression models described previously, this time excluding the “partially mentored” participants from the analyses instead of placing them in the “nonmentored” category. Another set of sensitivity analyses broadened the criterion of mentoring relationships that lasted ≥ 2 years to include all youth who had mentoring relationships that lasted ≥ 1 year and also fit the other criteria for being mentored. For all analyses, procedures that were developed by the authors of Add Health were used to correct for design effects and unequal selection probability to ensure unbiased results.²⁹

RESULTS

Table 1 contains descriptive statistics on all covariates for the full sample as well as the mentored and nonmen-

TABLE 2 Comparison of Outcomes for Youth in the General Population and YFC

Outcome	General Population (n = 13 991)	YFC (n = 316)
Mentorship, %	58 ^a	47 ^{b,c}
Education and employment, %		
Participation in higher education	63 ^d	47 ^{e,f}
Completion of high school	80 ^d	49 ^{e,f}
Working ≥10 h/wk or current enrollment in school	86 ^a	73 ^f
Psychological well-being		
Self-esteem, mean (SE)	4.2 (0.01)	4.1 (0.06) ^c
Depression scale, %	50	67 ^f
Suicidal ideation, %	7	10
Health outcomes		
General health, mean (SE)	4.0 (0.01)	3.8 (0.07) ^f
Physical activity, mean (SE)	0.95 (0.02)	0.80 (0.06) ^c
BMI, mean (SE)	25.8 (0.12) ^h	26.3 (0.41) ⁱ
Diagnosis of an STI, %	7	11
Behaviors, %		
Drug use in past year excluding alcohol and marijuana	13	11
Belonging to a gang	15	22 ^c
Hurting someone in a fight	6	7
Arrest after age 18 y	10 ^j	12 ^k
Current regular smoking	35	49 ^f

^a N = 13 879 because of exclusion from imputation.

^b N = 310 because of exclusion from imputation.

^c P < .05.

^d N = 13 905 because of exclusion of those still in high-school.

^e N = 312 because of exclusion of those still in high-school.

^f P < .001

^g N = 13 983 because of exclusion from imputation.

^h N = 13 666 because of exclusion from imputation.

ⁱ N = 312 because of exclusion from imputation.

^j N = 13 674 because of exclusion from imputation.

^k N = 309 because of exclusion from imputation.

tored subgroups. The sample was more than half female (57%) and white (65%); average age at wave 1 was 16 years. The parents of the majority (62%) of participants indicated that they had a high school diploma or less. Approximately half (47%) fit our criteria for being mentored. We found no differences between mentored and nonmentored youth on any of the covariates.

Table 2 contains descriptive statistics comparing youth in the general population with YFC. YFC were less likely to be mentored ($P < .05$) and exhibited a trend toward worse outcomes for all measures, with significant differences for 8 of the 15 outcomes.

On average, mentored youth reported having been in their relationships for 9.7 years (SE: 0.85; range 2–24 years; median: 8 years). Relationships were most often reported to be with nonparental family members (eg, grandparents, aunts/uncles; 36%); the remainder were reported to be with adults in professional roles (eg, teachers, guidance counselors, ministers; 21%), people in more informal capacities (eg, coaches, friends' parents, co-workers, friends; 31%), or "other" (11%). Mentored youth indicated most frequently that they received guidance and advice (56%) and emotional support (51%) from their mentors; smaller proportions indicated that the mentor functioned as a role model (11%), pro-

TABLE 3 Association Between Mentoring and Outcomes

Outcome ^a	OR (95% CI)	PAR, % ^b
Education and employment		
Participation in higher education ^{c,d}	1.90 (0.99–3.63) ^e	0.15
Completion of high school ^d	1.13 (0.50–2.53)	
Working ≥10 h/wk or current enrollment in school	0.70 (0.36–1.37)	
Psychological well-being		
Self-esteem ^c	1.95 (0.88–4.31)	
Depression scale	0.81 (0.36–1.80)	
Suicidal ideation ^f	0.14 (0.03–0.60) ^g	0.06
Health outcomes		
General health ^c	2.61 (1.14–5.94) ^h	0.13
Physical activity	1.36 (0.62–2.96)	
BMI ⁱ	0.81 (0.40–1.62)	
Diagnosis of an STI ^f	0.07 (0.01–0.39) ^g	0.08
Unhealthy behaviors		
Drug use in past year excluding alcohol and marijuana ^c	0.98 (0.34–2.83)	
Belonging to a gang	0.97 (0.42–2.22)	
Hurting someone in a fight ^f	0.04 (0.01–0.15) ^j	0.06
Arrest after age 18 y ^k	0.69 (0.26–1.86)	
Current regular smoking	0.67 (0.32–1.40)	

OR indicates odds ratio; CI, confidence interval.

^a N = 309 unless otherwise noted.

^b Calculated by using Poisson regression only for outcomes that had statistically significant ORs.

^c Primary outcome.

^d N = 305 because of exclusion of those still in high school.

^e P = .05.

^f For calculation of PAR%, outcomes were expressed in positive terms (eg, not suicidal).

^g P < .01.

^h P < .05.

ⁱ N = 299 because of exclusion from imputation.

^j P < .001.

^k N = 302 because of exclusion from imputation.

vided tangible or instrumental support (24%), or served as a substitute parental figure (10%).

Results of the multiple logistic regressions are contained in Table 3. For the primary outcomes, mentored participants were significantly more likely to report a high level of perceived general health ($P < .05$) and were more likely to report participation in higher education at a borderline level of significance ($P = .05$). The odds ratio for self-esteem was also positive (1.92) but nonsignificant; however, when a polychotomous ordinal logistic regression was run, the association became significant ($P < .01$), suggesting a positive linear relationship between mentoring and self-esteem. For the secondary outcomes, mentored participants were significantly less likely to report suicidal ideation ($P < .01$), having received a diagnosis of an STI ($P < .01$), or hurting someone in a physical fight ($P < .001$). The PAR of mentoring for significant outcomes ranged from 6% to 15%. Mentored status was also a significant predictor of the summary outcome measure ($P < .01$), with mentored participants predicted to have, on average, 1.1 additional positive outcomes when compared with nonmentored participants (3.2 vs 4.3 positive outcomes, respectively). When analyses were rerun with partially mentored participants excluded, odds ratios and confidence intervals were similar for all outcomes. This also was the case when a 1-year cutoff for the definition of

mentorship was used, although, in these analyses, participation from higher education became significant rather than borderline.

DISCUSSION

To our knowledge, this is the first study to focus on the association between natural mentoring relationships and the adult outcomes of YFC. We found that youth with histories of placement in foster care had worse adult outcomes compared with youth in the general population; however, YFC with mentoring relationships during adolescence had more favorable outcomes in multiple domains of late adolescent/young adult functioning than nonmentored youth. Areas of improvement included educational attainment (borderline significance), suicidal risk, physical aggression, general health, and risk for having an STI. Furthermore, we found a significant improvement in the total number of positive outcomes as represented by the summary measure. For individual outcomes with significant differences, the magnitude of risk reductions (ie, the amount of improvement directly attributable to the association with mentoring in YFC) was fairly small (PAR 6%–15%). Although these findings suggest that mentoring relationships with a nonparental adult cannot be expected to outweigh completely the significant risk conferred by the experience of having been in foster care, the improvements seen are clearly noteworthy in view of the poor adult outcomes seen among YFC.^{5–10}

These findings suggest that mentoring relationships that are acquired naturally through a youth's existing social networks may influence YFC in a broader and more consistent manner when compared with the results of previous studies of mentoring relationships.^{15,16} One of 2 studies that quantitatively evaluated the influence of mentoring relationships on YFC indicated a potential for improvements in psychosocial outcomes (self-image and the ability to interact with peers).¹⁶ The second study indicated a potential for negative outcomes (increased delinquent behavior) when relationships were disrupted in the first 6 months.¹⁵ The more general pattern of favorable outcomes that we found may be attributable in part to the unique design of our study (ie, that we were able to assess a variety of adult outcomes as a result of the large, longitudinal design of Add Health) but may also be attributable to the extended duration of the natural mentoring relationships, which approached nearly a decade. In contrast, mentoring relationships that are established through programs are typically much shorter in duration, in part because mentors are not members of the youth's ongoing social networks.³⁰

There are several limitations of this study. First, it was observational; therefore, we cannot conclude causality (ie, that mentoring relationships contributed to improved outcomes). Second, it is possible that some of the mentored youth considered their foster care parents to be mentors and that the association with improved outcomes was attributable to more stable relationships with these parental figures rather than with other, nonparental adults; however, the fact that only 10% of youth indicated that their mentors played a role as a parental

figure argues against this as a primary explanation. Third, it is possible that some of the relationships reported were cultivated in a formal program as opposed to emerging naturally in youths' lives. In another study based on another nationally representative sample of youth, however, only 2.4% of respondents reported a relationship with a formally designated mentor (T.E. Keller, PhD, C. Emery, PhD, D.L.D., PhD, and N. Silverthorn, PhD, unpublished data, 2006). Finally, our study had a small sample size. A larger sample might have detected other areas in which mentoring was associated with improved outcomes for YFC.

CONCLUSIONS

YFC who reported a mentor during adolescence demonstrated significantly improved outcomes compared with nonmentored youth. If confirmed through additional investigation, then this finding would support intervention efforts to cultivate mentoring relationships within the existing social networks of YFC. Such efforts might include training and other forms of assistance for YFC and adults in their lives whom they identify as potential mentors.³¹ In view of the high risk for poor outcomes and the well-established interpersonal vulnerabilities of adolescents in the child welfare system, a focus on promoting more stable and enduring forms of social capital could prove more beneficial than programs in which these youth are linked with unfamiliar adults.

ACKNOWLEDGMENTS

This project was supported by an award to Dr Ahrens from the Young Investigators Grant Program from the Ambulatory Pediatrics Association.

We thank the authors of Add Health; Jim Mercy for help in developing our violence-related outcomes; Preston Britner for help in developing the initial idea for this project; Steve McDonald for sharing work with the open-ended mentoring question; Elaine Adams Thompson for provision of space and access to the data for this project; Andrea Richardson for work cleaning and coding the data; and Patrick Royston for modifying the ICE program to allow us to use survey commands.

REFERENCES

1. Beier SR, Rosenfeld WD, Spitalny KC, Zansky SM, Bontempo AN. The potential role of an adult mentor in influencing high-risk behaviors in adolescents. *Arch Pediatr Adolesc Med.* 2000; 154(4):327–331
2. DuBois DL, Silverthorn N. Natural mentoring relationships and adolescent health: evidence from a national study. *Am J Public Health.* 2005;95(3):518–524
3. Zimmerman MA, Bingenheimer JB, Notaro PC. Natural mentors and adolescent resiliency: a study with urban youth. *Am J Community Psychol.* 2002;30(2):221–243
4. DuBois DL, Holloway BE, Valentine JC, Cooper H. Effectiveness of mentoring programs for youth: a meta-analytic review. *Am J Community Psychol.* 2002;30(2):157–197
5. Barth RP. On their own: the experiences of youth after foster care. *Child Adolesc Social Work J.* 1990;7(5):419–440
6. Courtney ME, Dworsky A. Early outcomes for young adults transitioning from out-of-home care in the USA. *Child Fam Soc Work.* 2006;11(3):209–219

7. Blome WW. What happens to foster kids: educational experiences of a random sample of foster care youth and a matched group of non-foster care youth. *Child Adolesc Social Work J*. 1997;14(1):41–53
8. Cheung SY, Heath A. After care: the education and occupation of adults who have been in care. *Oxford Rev Educ*. 1994;20(3):361–374
9. Goerge RM, Bilaver L, Lee BJ, Needell B, Brookhart A, Jackman W. Employment outcomes for youth aging out of foster care: final report [abstract]. Available at: www.chapinhall.org/article_abstract.aspx?ar=1353&L2=61&L3=130. Accessed February 13, 2007
10. Pecora PJ, Williams J, Kessler RC, et al. Assessing the educational achievements of adults who were formerly placed in family foster care. *Child Fam Soc Work*. 2006;11(3):220–231
11. Office of Juvenile Justice and Delinquency Prevention. *Mentoring Initiative for System Involved Youth*. Washington, DC: US Department of Justice; 2006
12. Stein M. Research review: young people leaving care. *Child Fam Soc Work*. 2006;11(3):273–279
13. Dubois DL, Silverthorn N. Characteristics of natural mentoring relationships and adolescent adjustment: evidence from a national study. *J Prim Prev*. 2005;26(2):69–92
14. Mech EV, Pryde JA, Rycraft JR. Mentors for adolescents in foster care. *Child Adolesc Social Work J*. 1995;12(4):317–328
15. Britner PA, Kraimer-Rickaby L. Abused and neglected youth. In: DuBois DL, Karcher M, eds. *Handbook of Youth Mentoring*. Thousand Oaks, CA: Sage Publications; 2005:482–492
16. Rhodes JE, Haight WL, Briggs EC. The influence of mentoring on the peer relationships of foster youth in relative and non-relative care. *J Res Adolesc*. 1999;9(2):185–201
17. Grossman JB, Rhodes JE. The test of time: predictors and effects of duration in youth mentoring relationships. *Am J Community Psychol*. 2002;30(2):199–219
18. Harris KM, Florey F, Tabor J, Bearman PS, Jones J, Udry JR. The National Longitudinal Study of Adolescent Health: research design. Available at: www.cpc.unc.edu/projects/addhealth/design. Accessed January 15, 2007
19. Klaw EL, Rhodes JE, Fitzgerald LF. Natural mentors in the lives of African American adolescent mothers: tracking relationships over time. *J Youth Adolesc*. 2003;32(3):223–232
20. Rhodes JE, Contreras JM, Mangelsdorf SC. Natural mentor relationships among Latina adolescent mothers: psychological adjustment, moderating processes, and the role of early parental acceptance. *Am J Community Psychol*. 1994;22(2):211–227
21. Werner EE, Smith RS. *Journeys From Childhood to Midlife: Risk, Resilience, and Recovery*. Ithaca, NY: Cornell University Press; 2001
22. Radloff LS. The CES-D Scale: a self-report depression scale for research in the general population. *Appl Psychol Meas*. 1977;1(3):385–401
23. Santor DA, Coyne JC. Shortening the CES-D to improve its ability to detect cases of depression. *Psychol Assess*. 1997;9(3):233–243
24. Grossman JB, Johnson A. Assessing the effectiveness of mentoring programs. In: Grossman JB, ed. *Contemporary Issues in Mentoring*. Philadelphia, PA: Public/Private Ventures; 1998:24–47
25. Soucy N, Larose S. Attachment and control in family and mentoring contexts as determinants of adolescent adjustment to college. *J Fam Psychol*. 2000;14(1):125–143
26. McDonald S, Erickson LD, Johnson MK, Elder GH. Informal mentoring and young adult employment. *Soc Sci Res*. 2007;4(4):1328–1347
27. Royston P. Multiple imputation of missing values: update of ice. *Stata J*. 2005;5(4):527–536
28. Zou G. A modified Poisson regression approach to prospective studies with binary data. *Am J Epidemiol*. 2004;159(7):702–706
29. Chantala K, Tabor J. *Strategies to Perform a Design-based Analysis Using Add Health Data*. Chapel Hill, NC: University of North Carolina; 1999
30. Rhodes JE. *Stand by Me: The Risks and Rewards of Mentoring Today's Youth*. Cambridge, MA: Harvard University Press; 2002
31. Zimmerman MA, Bingenheimer JB, Behrendt DE. Natural mentoring relationships. In: DuBois DL, Karcher M, eds. *Handbook of Youth Mentoring*. Thousand Oaks, CA: Sage Publications; 2005:143–157

Youth in Foster Care With Adult Mentors During Adolescence Have Improved Adult Outcomes

Kym R. Ahrens, David Lane DuBois, Laura P. Richardson, Ming-Yu Fan and Paula Lozano

Pediatrics published online Jan 8, 2008;

DOI: 10.1542/peds.2007-0508

Updated Information & Services

including high-resolution figures, can be found at:
<http://www.pediatrics.org/cgi/content/full/peds.2007-0508v1>

Subspecialty Collections

This article, along with others on similar topics, appears in the following collection(s):

Adolescent Medicine

http://www.pediatrics.org/cgi/collection/adolescent_medicine

Permissions & Licensing

Information about reproducing this article in parts (figures, tables) or in its entirety can be found online at:

<http://www.pediatrics.org/misc/Permissions.shtml>

Reprints

Information about ordering reprints can be found online:

<http://www.pediatrics.org/misc/reprints.shtml>

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™

