



Efficacy of a Primary Care-Based Intervention to Promote Parent-Teen Communication and Well-Being: A Randomized Controlled Trial

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Objective To evaluate the impact of a primary care-based, parent-directed intervention on changes in parent-teen communication, parental beliefs about adolescents, parent and adolescent well-being, adolescent distress, and adolescent positive affect from baseline to 2-month follow-up.

Study design In this randomized controlled trial, 120 adolescents (13-15 years of age) scheduled for well visits and their parents were randomized to the strength intervention or control group. The intervention included a booklet highlighting 3 key messages about adolescence, instructions to have a discussion with their teen about each other's strengths, and clinician endorsement. Outcomes were assessed before the well visit and 2 months later.

Results Adolescents were 61% female and 65% black. Parents were primarily female (97%); 72% had a 4-year degree or higher. The intervention had a positive impact on adolescent-reported open communication among adolescents with baseline low open communication scores ($B = 3.55$; $P = .005$; 95% CI, 1.07-6.03). Adolescents in the intervention group reported a decrease in distress (-1.54 vs 3.78 ; $P = .05$; partial eta squared [η^2] = 0.038) and increase in positive affect (1.30 vs -3.64 ; $P = .05$; $\eta^2 = 0.04$) compared with control group adolescents. The intervention did not affect parent-reported communication, parental beliefs, or adolescent well-being. Control parents demonstrated a marginal increase in well-being, whereas intervention parents did not (0.82 vs -0.18 ; $P = .07$; $\eta^2 = 0.029$).

Conclusions This study highlights the potential impact of primary care-based, universal, low-intensity interventions targeting parents of adolescents on parent-teen communication and important adolescent health outcomes. (*J Pediatr* 2020;222:200-6).

Trial registration [Clinicaltrials.gov](https://clinicaltrials.gov): NCT03496155.

There has been a call for pediatricians to reframe their approach to adolescent healthcare in a way that intentionally focuses on positive youth development as well as the prevention of risk behaviors, recognizing that cultivating adolescents' personal, environmental, and social assets is an important way to promote health.^{1,2} Positive youth development programs have a positive impact on quality of adult and peer relationships, interpersonal skills, and risk behaviors (eg, substance use, high-risk sexual behavior).³ In healthcare settings, a positive youth development approach could incorporate guiding parents to maintain close relationships and effective communication with their teens, as well as helping them to recognize and nurture their teens' strengths to promote adolescent resilience.⁴ Given evidence that parents have a significant influence during adolescence, supporting healthy parent-adolescent relationships should be a part of adolescent preventive care.⁵⁻⁷ Indeed, the American Academy of Pediatrics provides guidelines (ie, Bright Futures) to reinforce parenting skills and encourages clinicians to offer parenting advice.⁴ Such recommendations are guided by evidence showing that pediatricians have high credibility for promoting good parenting practices, because most parents trust their pediatrician.⁸⁻¹⁰

We developed a primary care-based parent-directed intervention, informed by positive youth development, to promote parent-teen communication, discussions about teen strengths, and positive parental beliefs about adolescents.¹¹ Our primary objective is to report the efficacy of the intervention. In contrast with selective programs aimed at high-risk youth, this intervention is a universal promotion for all parents of adolescents, in recognition that all parents are likely to benefit from information and strategies to enhance the parent-teen relationship. We hypothesized that participants randomly assigned to the intervention group would report greater increases in parent-teen communication and positive parental beliefs about adolescents at the 2-month follow-up than participants assigned to the control group. We also hypothesized that intervention parents and teens would report greater increases in psychological well-being at follow-up compared with controls. Secondary analyses using daily survey methodology

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η^2 Partial eta squared

examined if intervention adolescents would report greater increases in positive affect (ie, feelings of happiness, calm) and decreases in distress at follow-up compared with control adolescents.

Methods

Recruitment for this randomized controlled trial (NCT03496155) occurred at a community-based pediatric primary care practice that is part of a large academic pediatric healthcare system. The protocol was approved by our institutional review board. Eligible adolescents were 13–15 years old, scheduled for a well visit from May through October 2018, and established practice patients (ie, visit was not for a new patient). Parents and adolescents had to be fluent in written and spoken English and have their own email accounts and Internet access for survey completion. The participating parent had to be the parent or legal guardian and planning to attend the well visit. Adolescents were ineligible if they had a developmental delay or disorder that required special education or a psychiatric hospitalization in the last year. Parents were mailed a recruitment letter (n = 599) with contact information for the research team. The research team attempted to call and screen all parents who did not reach out to the team first. The team was able to reach 297 (49.58%) by telephone, and 130 (43.77%) were interested and deemed eligible. Of these, 120 (92.3%) consented and enrolled in the study.

After screening, research staff obtained verbal parental consent and permission and adolescent assent. Dyads were randomized at a 1:1 into 1 of 2 parallel groups: the strength intervention group or the control group, using computer-generated random numbers accessed by research staff after enrollment. Neither research staff nor dyad were blind to allocation. Parents and adolescents in both groups were sent electronic survey links before the well visit. If both completed the baseline survey, they were sent daily surveys via text message or email for the 7 days before the well visit. These daily surveys contained the same items every day, but different items than the baseline survey. Daily survey methods have the benefit of reduced recall bias compared with global questionnaires.¹² These analyses, which focus on the adolescent daily surveys only, were considered secondary, because we expected a smaller sample size for the daily survey data. All data were collected and managed using REDCap electronic data capture tools hosted at our institution.¹³

Intervention dyads arrived at the well visit 15 minutes early to receive the intervention materials (described elsewhere in this article). Control dyads met with research staff briefly at the well visit and received a study information folder that contained a study information sheet and a list of resources related to adolescent health issues (eg, acne, substance use, stress).

Two weeks after the well visit, research staff called intervention parents and adolescents and administered a survey

asking about the booklet and the talking about strengths discussion (described elsewhere in this article). If they did not have the talking about strengths discussion yet, they were instructed to have the discussion and a follow-up call was scheduled.

Two months after the well visit, parents and adolescents in both groups were sent electronic survey links with follow-up questionnaires. If both the parent and adolescent completed the follow-up survey, they were sent daily surveys via text message or email for the next 7 days. Follow-up assessments started in August 2018 and were complete in April 2019 (later than expected owing to rescheduled well visits), at which point the trial ended.

Intervention materials were drafted, revised, and finalized based on a literature review of parent-teen communication and positive youth development, prior descriptive research, expert consultation, and feedback from 2 clinicians and 42 parents and 43 adolescents from the pediatric primary care site.¹⁴ Feedback from adolescents and parents was generally positive and informed revisions to content, phrasing, and instructions. The final intervention consisted of an 8-page booklet that addressed key messages about parenting adolescents: (1) adolescence is a time of change and opportunity, and parents matter now more now ever; (2) teens need to remain connected to parents and at the same time develop a separate identity; and (3) parents need to recognize and talk with teens about their strengths. The booklet provided strategies for parents to connect with their adolescents and included instructions for the talking about strengths discussion, a guided discussion that prompted parent-teen dyads to identify and discuss the strengths they see in themselves and each other. Strengths were defined as qualities that help adolescents to become healthy, productive adults, such as being kind, creative, or hardworking. A list of examples of strengths, with definitions and synonyms, was provided. Dyads were instructed to take 10 minutes to think separately about the strengths they see in themselves and the other person, then come together and discuss for 10 minutes, using several prompts if needed (eg, “Why did you choose these strengths for the other person?”).

In the waiting room before the well visit, research staff reviewed the materials with intervention parents and teens (if present), delivered the 3 key messages, and instructed parents to complete the talking about strengths discussion with their teen in the next 2 weeks. During the well visit, clinicians verbally reinforced key intervention components and gave dyads a signed prescription summarizing these messages. Clinicians completed a checklist to indicate which key messages they delivered to the dyad during the well visit. A brief demonstration of these procedures was provided by the senior author to the clinicians at a meeting before the start of the study. Control dyads received usual care from the clinician.

Primary Measures

Demographics. Adolescent age was calculated from date of birth. Other demographics were measured by self-report at

screening or baseline and included parent and adolescent sex at birth, race, and ethnicity. Parents also reported their age, family structure, and highest level of education.

Communication. Parents and adolescents completed the Parent-Adolescent Communication Scale.¹⁵ The Parent-Adolescent Communication Scale yields subscale scores for open communication (eg, “I find it easy to discuss problems with my [mother/father or teen]”) and problematic communication (eg, “When talking with my [mother/father or teen] I have a tendency to say things that would be better left unsaid”). At baseline Cronbach alpha was 0.78 (open) and 0.80 (problematic) for parents and 0.88 (open) and 0.74 (problematic) for teens.

Parental Beliefs about Adolescents. Parents completed a questionnaire to assess beliefs about typical adolescents.¹⁶ This measure was chosen because research suggests that parents’ negative beliefs about adolescents in general were a stronger predictor of the behaviors they expect from their own adolescent than their own adolescent’s actual behavior.¹⁷ For each descriptor that is listed (eg, impulsive, generous, insecure, hardworking), parents rate the probability that a typical adolescent possesses that characteristic or displays that behavior, on a visual analog scale from 0 to 100. We used 4 subscales: risky, moody, prosocial, and friendly. Cronbach alpha ranged from 0.82 to 0.92 across the subscales at baseline.

Well-Being. Parents and adolescents completed the Flourishing Scale to assess well-being.¹⁸ Example items include “I lead a purposeful and meaningful life” and “My social relationships are supportive and rewarding,” responded to on a 7-point Likert scale. Cronbach alpha was 0.81 for parents and 0.82 for teens at baseline.

Secondary Measures from the Daily Survey

Adolescent Distress and Positive Affect. For each day of the daily survey, adolescents rated how much they experienced various feelings that day on a visual analogue scale from 0 (not at all) to 100 (a lot). An average of the 7 anxiety and depression items was used to create a score for distress for each day; average distress across the 7 days was then calculated. The same method was used for the 3 positive affect items (happy, joy, and calm).^{19,20} The baseline Cronbach alpha was 0.91 for distress and 0.82 for positive affect.

Analyses

We used *t* tests and χ^2 tests to determine if intervention and control participants differed on demographics (teen age, sex, and race; family structure; income; and highest education) and if there were differences between those who did and did not complete 2-month follow-up on demographics and baseline scores for the primary outcomes. Our approach to test for intervention effects was ANCOVA, using change in the outcome from baseline to follow-up as the dependent variable, controlling for the relevant baseline score. Consis-

tent with reporting guidelines for ANCOVA, we report the effect size, which is the proportion of variance in the dependent variable that is attributable to the factor in question, as partial eta squared (η^2) for both group (intervention vs control) and the relevant baseline score. Assumptions of ANCOVA, including equivalence of the groups on baseline scores for the outcomes, linear relationship between baseline and follow-up scores, and homogeneity of regression slopes for the intervention and control groups, were tested first; all assumptions were met except where noted.

Analyses were conducted using complete case analysis (using data from participants with complete data) and were based on assigned group, regardless of whether the participant completed the intended intervention.²¹ This approach was chosen instead of intention to treat, which can be overly conservative for pilot studies of novel interventions.²² Statistical analysis was performed using SAS version 9.4 (SAS Institute Inc, 2008, Cary, North Carolina) and SPSS version 22.0 (IBM Corp, 2011, Chicago, Illinois). We conducted an a priori power analysis; assuming a Cohen *d* of 0.50 (medium effect) for effect of the intervention on parent-teen communication, probability level of 0.10, 2-tailed hypothesis, and power of 0.80, we needed 51 dyads per group at follow-up. Consistent with Schoenfeld’s¹⁷ recommendation for pilot studies testing preliminary efficacy, we selected a high type 1 error rate. Based on our prior work in this setting, we anticipated a retention rate of 85%; as such, we enrolled and randomized 60 dyads per group (*n* = 120 total dyads) at baseline.

Results

Figure 1 (available at www.jpeds.com) shows the CONSORT diagram of participant screening, randomization, and retention. Parents were primarily female (97%), and adolescents were 38% male, and 65% black, 23% white, and 3% Hispanic (roughly comparable with the population of adolescents seen for well visits at the practice, which is 46% male, 61% black, and 4% Hispanic) (**Table 1**). There were no significant differences (all *P* values > .05) in demographics between intervention and control participants, or between participants who completed follow-up and those who did not with respect to demographics or baseline scores on the outcomes, with 1 exception. Parents who did not complete follow-up had youth with lower well-being at baseline, 36.80 vs 46.64, *t* (114) = -3.40; *P* = .001. Adolescents were included in the daily survey analyses if they had ≥ 1 day of daily survey data at both baseline and follow-up, which was the case for 80% (*n* = 48) of adolescents in the intervention group and 85% (*n* = 51) in the control group. There were no significant differences (all *P* values > .05) in demographics between adolescents included in the diary analysis and those who were not. For the overall sample, the mean number of days completed at baseline was 6.04 \pm 1.79 (range, 0-7) and at follow-up was 5.63 \pm 2.12 (range, 0-7).

Table I. Demographic characteristics and comparison by group (n = 120 dyads enrolled)

Characteristics	Total (n = 120)	Intervention (n = 60)	Control (n = 60)	Group difference
Parents				
Age, y	44.53 ± 6.43 (32-59)	45.36 ± 6.54 (32-59)	43.69 ± 6.25 (32-55)	ns
Sex				ns
Female	97 (116)	97 (58)	97 (58)	
Male	3 (3)	3 (2)	2 (1)	
Refused	1 (1)	0	2 (1)	
Family structure				ns
Two parents	53 (63)	55 (33)	52 (30)	
Two parents—step family	10 (12)	7 (4)	14 (8)	
Single parent	36 (43)	38 (23)	35 (20)	
Education				ns
HS/GED/some college	28 (33)	30 (18)	26 (15)	
Associate/4-y degree	41 (48)	42 (25)	40 (23)	
Masters/doctoral degree	31 (37)	28 (17)	34 (20)	
Family income (US\$)				ns
<20 000	3 (4)	2 (1)	5 (3)	
20 000-39 000	13 (15)	15 (9)	10 (6)	
40 000-59 000	16 (19)	18 (11)	14 (8)	
60 000-79 000	16 (19)	10 (6)	22 (13)	
80 000-99 000	8 (9)	3 (2)	12 (7)	
>100 000	34 (40)	40 (24)	28 (16)	
Refused	10 (12)	12 (7)	9 (5)	
Teens				
Age, y	14.33 ± 0.90 (13.02-15.99)	14.22 ± 0.93 (13.02-15.98)	14.43 ± 0.86 (13.02-15.99)	ns
Sex				ns
Female	61 (73)	55 (33)	67 (40)	
Male	38 (46)	45 (27)	32 (19)	
Refused	1 (1)		1 (1)	
Race				ns
Black	65 (78)	66 (35)	72 (43)	
White	23 (27)	34 (18)	15 (9)	
Other/>1	7 (9)	10 (6)	5 (3)	
Refused	5 (6)	2 (1)	8 (5)	
Hispanic				ns
Yes	3 (3)	2 (1)	4 (2)	
No	94 (113)	98 (58)	96 (55)	
Unsure	2 (2)	—	—	
Refused	2 (2)	—	—	

GED, graduate equivalency degree; HS, high school; ns, not significant. Values are mean ± SD (range) or percent (n).

Effect of the Intervention on Parent-Teen Communication, Parental Beliefs, and Well-Being

ANCOVA assumptions for teen report of open communication were not met, because assignment group interacted with baseline score in predicting follow-up score ($P = .008$). Using the Johnson-Neyman technique, we found that the intervention had a positive impact on teen-reported open communication only among adolescents with lower reported baseline open communication scores.²³ We probed the interaction by testing the conditional effect of group assignment when baseline scores for teen-reported open communication were 1 SD below the mean and 1 SD above the mean. Among adolescents who reported low open communication at baseline, intervention-group adolescents reported higher open communication at follow-up compared with control adolescents ($B = 3.55$; $SE = 1.25$; $P = .005$; 95% CI, 1.07-6.03). Among adolescents who reported high open communication at baseline, there was no difference between the intervention and control groups at follow-up ($P = .31$) (Figure 2; available at www.jpeds.com).

There were no intervention effects on changes in teen report of problematic communication or parent report of

open or problematic communication (Table II). Similarly, there were no intervention effects on changes in parental beliefs about adolescents as risky, moody, prosocial, or friendly (Table II).

There was no intervention effect on change in adolescent well-being (Table II). For parent well-being, there was an effect of assignment group, but in the opposite direction of what was expected. Control parents demonstrated a marginal increase in well-being at follow-up, whereas intervention parents did not (0.82 vs -0.18 ; $P = .07$; $\eta^2 = 0.02$; Table II).

Secondary Analyses: Effect of the Intervention on Adolescent Distress and Positive Affect

Intervention adolescents demonstrated a decrease in distress at follow-up, and control adolescents demonstrated an increase (-1.54 vs 3.78 ; $P = .05$; $\eta^2 = 0.038$; Table II). Moreover, intervention adolescents demonstrated an increase in positive affect at follow-up, whereas control adolescents demonstrated a decrease (1.30 vs -3.64 ; $P = .05$; $\eta^2 = 0.04$) (Table II).

Table II. ANCOVA results for intervention effects on outcomes

Variables	Intervention	Control	F-statistic	P value	η^2 : Group (intervention vs control)	η^2 : Baseline score
Teen reported variables						
Open communication	1.56 ± 5.58	0.21 ± 4.72	$F(1, 109) = 1.61$	.21	0.015	0.146
Problematic communication	-1.09 ± 4.84	-1.75 ± 5.27	$F(1, 109) = 0.83$	.37	0.008	0.117
Well-being	1.02 ± 5.21	0.57 ± 4.79	$F(1, 106) = 0.04$	.84	0.000	0.268
Distress	-1.54 ± 11.05	3.78 ± 14.09	$F(1, 96) = 3.82$	.05	0.038	0.040
Positive affect	1.30 ± 11.39	-3.64 ± 11.41	$F(1, 96) = 3.96$	.05	0.040	0.033
Parent-reported variables						
Open communication	0.66 ± 3.66	-0.14 ± 3.88	$F(1, 110) = 0.38$	.54	0.003	0.282
Problematic communication	0.46 ± 4.11	0.60 ± 4.57	$F(1, 110) = 0.02$	.88	0.000	0.152
Well-being	-0.18 ± 3.84	0.82 ± 3.20	$F(1, 110) = 3.25$	.07	0.029	0.143
Beliefs: risky	0.07 ± 15.68	-1.99 ± 16.57	$F(1, 111) = 0.39$	.53	0.004	0.124
Beliefs: moody	0.94 ± 17.38	-2.08 ± 15.70	$F(1, 111) = 0.51$	.48	0.005	0.110
Beliefs: friendly	0.99 ± 13.22	-1.34 ± 16.02	$F(1, 111) = 0.20$	.66	0.002	0.193
Beliefs: prosocial	0.75 ± 13.44	-0.46 ± 13.03	$F(1, 111) = 0.05$	.82	0.000	0.215

F score and P value refer to comparison of change scores between the intervention and control groups after controlling for the corresponding baseline score. Mean change for each group reflects the follow-up score minus the baseline score for the variable. η^2 indicates the effect size, that is, the proportion of variance in the dependent variable that is attributable to the factor in question (small, 0.01; medium, 0.06; large, 0.13). For communication subscales, possible scores range from 10 to 50; for well-being, 8 to 56; for distress, positive affect, and beliefs, 0 to 100. Values are mean change \pm SD, unless otherwise indicated.

Discussion

This novel intervention delivered in the context of adolescent preventive care had a beneficial impact on adolescent-reported open communication among adolescents with lower baseline open communication scores and beneficial effects on positive affect and distress among all adolescents in the intervention group when compared with the control groups. The talking about strengths activity was designed to prompt parents and adolescents to engage in a discussion to enhance understanding of one another and facilitate a dialogue about strengths that might not occur in the context of everyday life. The reciprocal nature of the discussion is unique, as many parent-teen interventions focus on 1-way communication from parent to teen.

Mental health outcomes related to decreases in adolescent distress and increases in positive affect are important given clear links between positive and negative affect and adolescent depression.^{24,25} Our findings suggest that incorporating specific strategies to implement a positive youth development approach in healthcare may be one way to influence important adolescent mental health outcomes. Together with prior communication interventions showing a positive impact on frequency of parent-teen communication about sexual health, alcohol use, teen driving, and adolescent behavior, the present study provides strong support for future research to further evaluate the potential impact and reach of low intensity interventions that target parents of adolescents in the context of pediatric primary care.²⁶⁻²⁸

A universal approach addressing communication may be of particularly high value to those adolescent patients who may benefit the most (ie, those with low levels of open communication). The intervention did not impact adolescent report of problematic communication or parental perceptions of communication. The lack of effect on parent-reported communication was unexpected, because the booklet is directed to parents. However, this finding is consis-

tent with prior research and may reflect that adolescents are attuned to subtleties in their parents' communication that parents themselves are not aware of.²⁷ Nevertheless, the effect on adolescent-reported communication is important, given prior research indicating that adolescent perceptions of parenting influence behavior and outcomes.²⁹

The finding of marginally increased parental well-being in the control group was surprising. Although this finding could be spurious, it is possible that the intervention raised questions for parents in the intervention group that the control parents did not experience. For example, the booklet, which highlighted ways to stay connected with adolescents and the continued importance of parents, may have engendered concerns for parents about the status of their relationship with their adolescent. Alternatively, the talking about strengths discussion may have uncovered areas of dissonance in the parent-adolescent relationship or concerns about the absence of specific adolescent or parent strengths. These possibilities and the robustness of this finding should be explored in future research.

This study should be interpreted in light of several limitations. First, the finding related to communication was limited to adolescents with lower open communication scores at baseline, although we may have been able to detect overall effects with a larger sample. Second, effect sizes were small to moderate, which is consistent with expectations for a low-intensity universal intervention. Nevertheless, a relatively small effect size from an intervention systematically delivered to all adolescents receiving well visits has the potential to produce significant population-level effects.³⁰ Third, we cannot exclude response bias as a limitation because we only analyzed participants who completed surveys at both baseline and follow-up. This risk is minimized because there were minimal differences between the baseline sample and those who completed follow-up. Fourth, our control condition did not account for provider attention, so we cannot rule this out as an explanation for the significant effects. Finally, the parent participants were primarily mothers with a

relatively high education level; we do not know if the intervention would impact adolescent-father dyads or families with a lower educational status in similar ways.

Future research is needed to examine the feasibility of expanding the intervention to multiple primary care practices, with a larger sample and more racially and economically diverse participants. A longer follow-up period is needed, to determine if intervention effects are maintained or if new effects emerge over time and identify potential mechanisms of change. Research is also needed to determine if the intervention can also prevent risk behaviors and negative outcomes that may emerge during adolescence, such as depressive symptoms and substance use. Finally, fathers should be actively recruited for interventions designed to enhance parent-teen communication.

These findings underscore the promise of this universal, low intensity parent-directed intervention delivered in primary care to promote parent-teen communication and adolescent health outcomes. ■

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Data Statement

Data sharing statement available at www.jpeds.com.

References

- Ginsburg KR, Carlson EC. Resilience in action: an evidence-informed, theoretically driven approach to building strengths in an office-based setting. *Adolesc Med* 2011;22:458-81.
- Duncan PM, Garcia AC, Frankowski BL, Carey PA, Kallock EA, Dixon RD, et al. Inspiring healthy adolescent choices: a rationale for and guide to strength promotion in primary care. *J Adolesc Health* 2007;41:525-35.
- Catalano RF, Berglund ML, Ryan JAM, Lonczak HS, Hawkins JD. Positive youth development in the United States: research findings on evaluations of positive youth development programs. *Ann Am Acad Pol Soc Sci* 2004;591:98-125.
- Hagan JE, Shaw JS, Duncan PM. *Bright Futures: guidelines for health supervision of infants, children, and adolescents*. 4th ed. Elk Grove Village, IL: American Academy of Pediatrics; 2017.
- Sandler I, Ingram A, Wolchik S, Tein J, Winslow E. Long-term effects of parenting-focused preventive interventions to promote resilience of children and adolescence. *Child Dev Perspect* 2015;9:164-71.
- Hazel N, Oppenheimer C, Technow J, Young J, Hankin B. Parent relationship quality buffers against the effect of peer stressors on depressive symptoms from middle childhood to adolescence. *Dev Psychol* 2014;50:2115-23.
- Steiner RJ, Sheremenko G, Lesesne C, Dittus PJ, Sieving RE, Ethier KA. Adolescent connectedness and adult health outcomes. *Pediatrics* 2019;144:e20183766.
- Leslie LK, Mehus CJ, Hawkins JD, Boat T, McCabe MA, Barkin S, et al. Primary health care: potential home for family-focused preventive interventions. *Am J Prev Med* 2016;51:S106-18.
- Schor EL. Rethinking well-child care. *Pediatrics* 2004;114:210-6.
- IOM (Institute of Medicine) and NRC (National Research Council). *The science of adolescent risk-taking: workshop report*. Committee on the Science of Adolescence. Washington, DC: National Academies Press; 2011.
- Lerner RM, Lerner JV, von Eye A, Bowers EP, Lewin-Bizan S. Individual and contextual bases of thriving in adolescence: a view of the issues. *J Adolesc* 2011;34:1107-14.
- Laurenceau JP, Bolger N. Using diary methods to study marital and family processes. *J Fam Psychol* 2005;19:86-97.
- Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, Conde JG. Research electronic data capture (REDCap) - A metadata-driven methodology and workflow process for providing translational research informatics support. *J Biom Inform* 2009;42:377-81.
- Ford CA, Cheek C, Culhane J, Fishman J, Mathew L, Salek EC, et al. Parent and adolescent interest in receiving adolescent health communication information from primary care clinicians. *J Adolesc Health* 2016;59:154-61.
- Olson DH. *Family inventories: inventories used in a national survey of families across the life cycle*. St Paul, MN: Family Social Science, University of Minnesota; 1985.
- Buchanan CM, Holmbeck GN. Measuring beliefs about adolescent personality and behavior. *J Youth Adolesc* 1998;27:607-27.
- Jacobs JE, Chhin CS, Shaver K. Longitudinal links between perceptions of adolescence and the social beliefs of adolescents: are parents' stereotypes related to beliefs held about and by their children? *J Youth Adolesc* 2005;34:61-72.
- Diener E, Wirtz D, Tov W, Kim-Prieto C, Choi D, Oishi S, et al. New well-being measures: short scales to assess flourishing and positive and negative feelings. *Soc Indic Res* 2010;97:143-56.
- Chung GH, Flook L, Fuligni AJ. Daily family conflict and emotional distress among adolescents from Latin American, Asian, and European backgrounds. *Dev Psychol* 2009;45:1406-15.
- Yip T, Fuligni AJ. Daily variation in ethnic identity, ethnic behaviors, and psychological well-being among American adolescents of Chinese descent. *Child Dev* 2002;73:1557-72.
- Jakobsen JC, Gluud C, Wetterslev J, Winkel P. When and how should multiple imputation be used for handling missing data in randomised clinical trials: a practical guide with flowcharts. *BMC Med Res Methodol* 2017;17:162.
- Shrier I, Verhagen E, Stovitz SD. The intention-to-treat analysis is not always the conservative approach. *Am J Med* 2017;130:867-71.
- D'Alonzo KT. The Johnson-Neyman Procedure as an Alternative to ANCOVA. *West J Nurs Res* 2004;26:804-12.
- Forbes EE, Dahl RE. Neural systems of positive affect: relevance to understanding child and adolescent depression? *Dev Psychopathol* 2005;17:827-50.
- Compas BE, Connor-Smith JK, Jaser SS. Temperament, stress reactivity, and coping: implications for depression in childhood and adolescence. *J Clin Child Adolesc Psychol* 2004;33:21-31.
- Mirman JH, Goodman ES, Friedrich E, Ford CA. Talking with teens about traffic safety: initial feasibility, acceptability, and efficacy of a parent-targeted intervention for primary care settings. *J Safety Res* 2018;66:113-20.
- Ford CA, Mirman JH, García-España JF, Thiel MCF, Friedrich E, Salek EC, et al. Effect of primary care parent-targeted interventions on parent-adolescent communication about sexual behavior and alcohol use: a randomized clinical trial. *JAMA Netw Open* 2019;2:e199535.
- Guilamo-Ramos V, Bouris A, Jaccard J, Gonzalez B, McCoy W, Aranda D. A parent-based intervention to reduce sexual risk behavior in early adolescence: building alliances between physicians, social workers, and parents. *J Adolesc Health* 2011;48:159-63.

29. Dittus PJ, Jaccard JJ. Adolescents' perceptions of maternal disapproval of sex: relationship to sexual outcomes. *J Adolesc Health* 2000;26:268-78.
30. Chu JTW, Farruggia SP, Sanders MR, Ralph A. Towards a public health approach to parenting programmes for parents of adolescents. *J Public Health* 2012;34(Suppl 1):141-7.

50 Years Ago in *THE JOURNAL OF PEDIATRICS*

The Clinical Significance of Serologic Testing for Juvenile Idiopathic Arthritis: Then and Now

Bluestone R, Goldberg LS, Katz RM, Marchesano JM, Calabro JJ. Juvenile Rheumatoid Arthritis: A Serologic Survey of 200 Consecutive Patients. *J Pediatr* 1970;77:98-102.

The authors surveyed the frequency of finding positive rheumatoid factor (RF), positive antinuclear antibody (ANA), and immunoglobulin elevations in 200 patients with juvenile rheumatoid arthritis (JRA) from all age groups and subtypes. They found RF in 12% of patients, ANA in 4%, and elevated Immunoglobulin M (IgM), Immunoglobulin A (IgA), and Immunoglobulin G (IgG) immunoglobulin levels in 10%, 17%, and 25%, respectively. The patients with RF and elevated immunoglobulin levels had more severe disease, manifested by hip involvement and poor functional status. The number of patients with a positive ANA, tested on a substrate of human leukocytes, was too small to allow for clinical correlations.

Although the prevalence and clinical associations of RF and immunoglobulin levels are still valid, the authors markedly underestimated the proportion of patients with ANA and thus missed their clinical significance. RF is found in 5%-10% of patients with JRA/juvenile idiopathic arthritis (JIA), primarily among adolescent females presenting with symmetric small joint disease. Essentially, this represents early-onset rheumatoid arthritis (RA). Indeed, this form of JIA is associated with a severe course and poor prognosis and necessitates early initiation of aggressive disease-modifying therapy. In the last 10-15 years, a new class of autoantibodies with greater sensitivity and specificity, often appearing earlier than RF, was discovered among patients with RA (including adolescents with polyarthritis JIA) and introduced to routine clinical care. These antibodies, known as anti-citrullinated protein antibodies, are directed against cyclic citrullinated peptides and are often associated with or triggered by periodontitis or cigarette smoking, risk factors for the development of RA.

Currently, the prevalence of ANA in patients with JIA is approximately 50%. The discrepancy with this report is probably due to the method of detecting ANA, which currently involves indirect immunofluorescence using human epithelial type 2 cells. Other modern methods of detecting ANA by enzyme-linked immunosorbent assay or multiplex protein analysis are fraught with many false-negative results in JIA and are not recommended for use in these patients.

Finding ANA in patients with JIA is of extreme importance. Patients with ANA, especially young females early in the course of disease, are at high risk (up to 30%) of developing uveitis, which is mostly asymptomatic. Thus, they need to undergo regular ophthalmologic slit-lamp screening every 3 months.¹

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Reference

1. Angeles-Han ST, Ringold S, Beukelman T, Lovell D, Cuello CA, Becker ML, et al. 2019 American College of Rheumatology/Arthritis Foundation guideline for the screening, monitoring, and treatment of juvenile idiopathic arthritis-associated uveitis. *Arthritis Rheumatol* 2019;71:864-77.

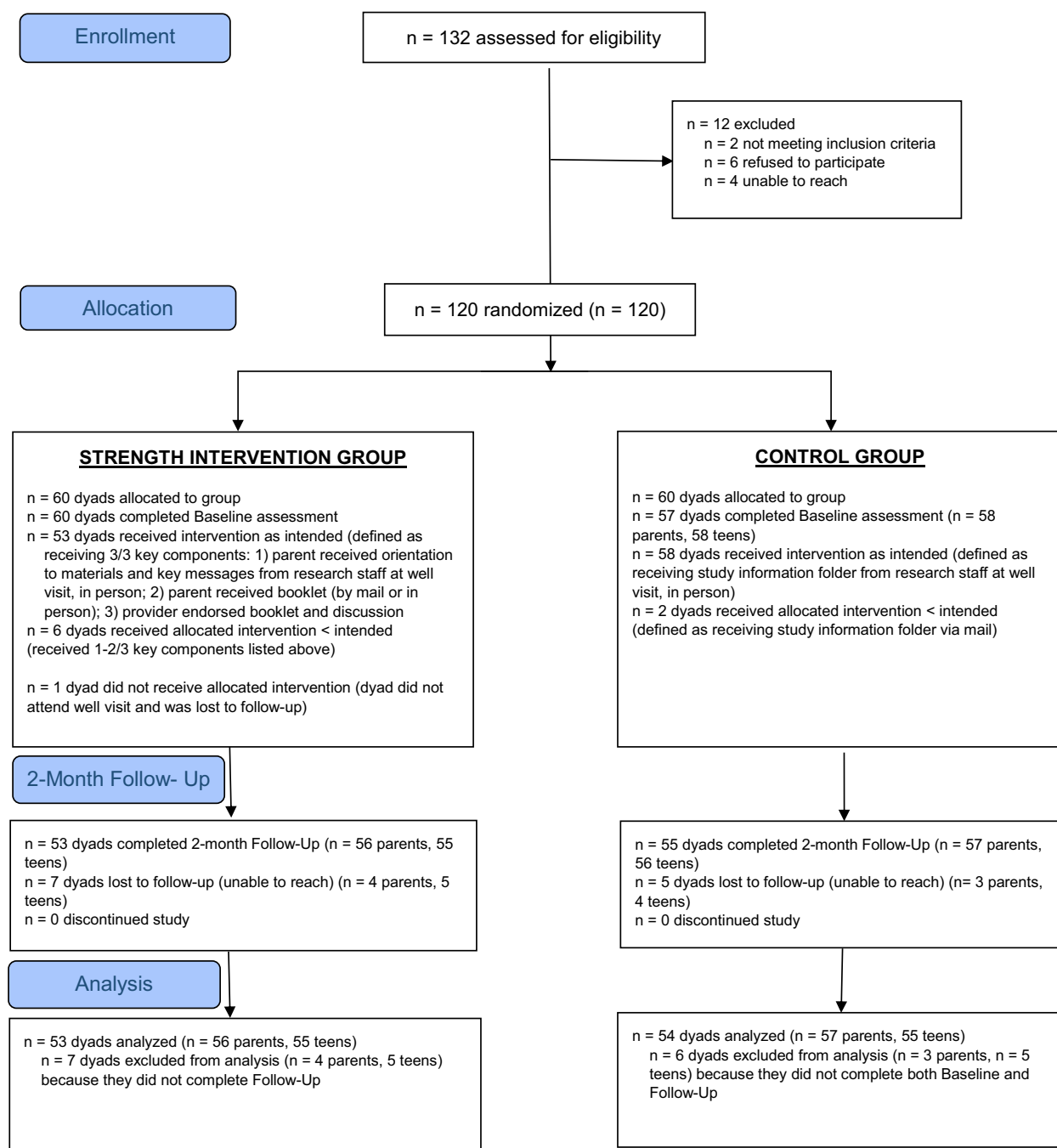
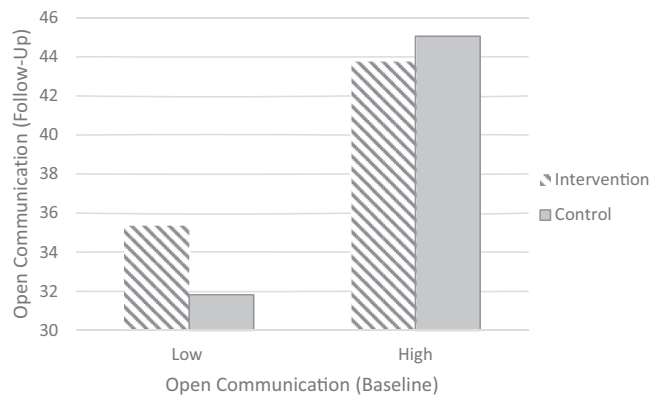


Figure 1. CONSORT diagram.



Note: Low and high defined as 1 SD below or above sample mean, respectively. Possible scores range from 10 to 50.

Figure 2. Influence of baseline teen-reported open communication at baseline on the impact of intervention on teen-reported open communication at follow-up.