

Physical Activity; Youth; Underserved Populations

Nonresident African-American Fathers' Influence on Sons' Exercise Intentions in the Fathers and Sons Program

Katrina R. Ellis, MPH, MSW; Cleopatra Howard Caldwell, PhD; Shervin Assari, MD; E. Hill De Loney, MA

Abstract

Purpose. To test the effects of a family-centered intervention for enhancing intentions to exercise among African-American boys with nonresident fathers.

Design. Quasi-experimental, intervention study.

Setting. Two Midwestern cities.

Subjects. A total of 287 nonresident African-American fathers and their 8- to 12-year-old sons ($n = 158$ intervention dyads; $n = 129$ comparison dyads).

Intervention. The Fathers and Sons Program is a 15-session family-based intervention focused on promoting the health of African-American boys by enhancing the parenting attitudes and behaviors of their nonresident fathers and positively influencing parent-child interactions.

Measures. Demographic information and intervention outcomes were assessed at baseline and follow-up via self-report.

Analysis. Descriptive statistics, logistic regression, and structural equation modeling.

Results. The intervention was successful in improving the exercise intentions of boys ($B = .246$; $p = .005$; $B = .210$; $p = .012$). The effect was not direct; increasing contact between fathers and sons ($B = .154$; $p = .001$), enhancing the quality of their relationship ($B = .366$; $p < .001$), and improving fathers' own intentions to exercise ($B = .265$; $p = .001$) were mediating factors.

Conclusion. Interventions aimed at improving exercise intentions among African-American boys with nonresident fathers should focus on relational factors. (*Am J Health Promot* 2014; 29[2]:89–98.)

Key Words: Intervention Studies, Adolescents, Sons, Fathers, Intention, Exercise, Prevention Research. Manuscript format: research; Research purpose: intervention testing; Study design: quasi-experimental; Outcome measure: cognitive; Setting: family; Health focus: physical activity; Strategy: skill building/behavior change; Target population age: youth; Target population circumstances: African-American

INTRODUCTION

Despite the short- and long-term health benefits of being physically active,^{1–3} many children and adolescents in the United States do not engage in recommended levels of physical activity^{4–6} and overall, physical activity levels among adolescents seem to be on the decline.^{7,8} Though the results have been mixed, some data from subpopulations of adolescents reveal that minority adolescents—African-Americans in particular—are less likely to engage in physical activity than their white counterparts.^{9–12} Consistent with other groups, African-American adolescent boys are often more physically active than African-American adolescent girls⁶; however, their levels of physical activity fall below those of white adolescent boys.¹¹

Previous research has shown that parents play a key role in determining the physical activity levels of their children through a variety of mechanisms including parental modeling of health behaviors^{13,14} and social support for physical activity.^{15,16} However, racial differences in the roles of mothers and fathers in the lives of children and adolescents^{17–19}; differences in the lived experiences of African-American men and women^{20,21}; and a lack of racial diversity in studies examining parental influences on physical activity¹⁶ signal a need for further examination of familial factors that influence physical activity.

The structure of African-American families may uniquely affect parental influences on physical activity. African-

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American families disproportionately experience single-mother households and nonmarital births,^{22,23} and thus, a number of African-American fathers may not live in the same residence as their children. Research suggests that African-American children—especially sons—may benefit from contact with their nonresident fathers.²⁴ Unfortunately, limited research seeks to understand the positive influence of nonresident African-American fathers in the lives of male children and adolescents, particularly the influence of these fathers on their sons' health. Even less is known about the role of nonresident African-American fathers in shaping the physical activity behaviors of their male children.

What we do know, however, is that despite the challenges that may exist when fathers and sons do not live together,^{17,25} nonresident fathers often remain involved with their children and this involvement can result in positive child outcomes.²⁶ Previous research has revealed that fathers' own physical activity behaviors have an influence on the physical activity engagement of their sons,¹⁶ and in some cases, to an even greater extent than that of mothers.²⁷ Given the known challenges facing the health of African-American males^{28,29} and the influence of early life experiences on health throughout the life course,^{30,31} understanding how nonresident African-American fathers influence the physical activity of their sons, and finding ways to intervene to support nonresident parenting behaviors that promote physical activity, could lead to better short- and long-term health outcomes for African-American boys in areas such as diabetes, hypertension, and cardiovascular disease for which African-American males are disproportionately burdened.^{32,33}

PURPOSE

The Fathers and Sons Program is a theory-based and family-focused intervention for nonresident African-American fathers and their sons.³⁴⁻³⁶ This intervention is guided by the belief that interventions seeking to improve the health of African-American boys should recognize the integral role of

the family, and fathers in particular, for promoting and maintaining healthy lifestyles. The purpose of this study is to explore how the participation of African-American nonresident father and sons in the Fathers and Sons Program influenced the sons' intentions to engage in physical activity.

THEORETICAL FRAMEWORK

The theory of reasoned action³⁷ is a key theory guiding the development of the Fathers and Sons Program. According to this theory, the most important determinant of individual behavior is a person's intention to engage in that behavior.³⁸ It posits that the intention to engage in a behavior is influenced by the attitudes (including behavioral beliefs and evaluations of outcomes) and subjective norms (including normative beliefs and motivation to comply) that an individual associates with the behavior.³⁷ In this intervention, sons' beliefs about physical activity and the outcomes of that activity (i.e., attitudes) are expected to influence their intentions to exercise. In addition, it is expected that whether or not sons believe what people important to them think about physical activity, such as their fathers, and their motivation to comply with those opinions (i.e., subjective norms), will also influence intentions to engage in physical activity. Previous studies have discussed the usefulness of designing interventions that focus on increasing intentions to exercise.^{38,39}

The importance of family and relationships in health outcomes is well established and supported by theory. According to family systems theory, the family can be viewed as a social system having its own rules and behavioral patterns.⁴⁰ In line with this theory, many family-focused interventions, such as the Fathers and Sons Program, view the family as a system of interdependent parts.^{40,41} Further, models of social networks and social support⁴² also undergird the conceptual model driving this intervention and draw attention to the importance of father-son relationships in understanding sons' health outcomes. Research examining the role of parenting on physical activity suggests that the in-

fluence that nonresident father and son relationships have on sons' intentions to exercise is likely associated with a number of factors including the frequency and quality of their interactions^{16,43}; the emotional closeness they feel towards one another⁴⁴⁻⁴⁶; and the quality of their communication.⁴³

RESEARCH HYPOTHESES

We hypothesized that participation in the Fathers and Sons Program would increase sons' intentions to exercise, but that this intervention effect would not be direct. Rather, based upon the literature supporting the importance of parent-child relationships for adolescent outcomes and the role of parents in shaping the health behaviors of their children, we hypothesized that the intervention's effect on sons' intentions to exercise would be mediated by (1) the frequency of contact between fathers and sons; (2) the quality of the father-son relationship; and (3) by the fathers' own intentions to exercise.

METHODS

Study Design and Participants

The effectiveness of the intervention was evaluated by using a quasi-experimental design. Families were recruited for the intervention and comparison groups from two separate Midwestern cities with similar demographic characteristics. Families for each group were recruited most often from schools, in addition to community organizations, and churches. As a community-based participatory research project, community organizations participated in the recruitment process for both groups and served as intervention sites. To be eligible for the study, participants met the following criteria: (1) African-American biological fathers and their 8- to 12-year-old sons who were not living together; (2) mothers or legal guardians of the sons consented for their sons, sons provided assent, and fathers provided their own consent; and (3) the father could not be functionally impaired by substance abuse. The response rate for the intervention group was 85.4% ($n = 158$ families) and the response rate for the

Table 1
Demographic Characteristics of Fathers and Sons by Group at Baseline†

	Intervention (n = 158)	Comparison (n = 129)	χ^2 or t-Test
Fathers' characteristics			
Age, y, M (SD)	37.9 (7.2)	37.6 (8.4)	NS
Marital status, %			
Married/partner	25.8	35.7	NS
Widowed/divorced/separated	27.1	24.8	
Never married	47.1	39.5	
Ever married to son's mother, %	17.7	21.1	NS
Less than high-school education, %	22.3	21.3	*
Employment status, %			NS
Working	51.9	49.6	
Not working	36.7	37.8	
Temporarily laid off	11.4	12.6	
Perceptions of financial resources, %			NS
Not enough to get by	26.6	26.6	
Barely enough to get by	25.9	32.8	
Enough to get by but no extras	36.7	35.9	
More than enough to get by	10.8	4.7	
Legal agreement to pay child support, %	70.3	75.4	NS
How long lived with son, %			*
Never lived with son	25.5	21.3	
Lived with son 5 y or less	54.2	40.9	
Lived with son >5 y	20.3	37.8	
Sons' characteristics			
Age, y, M (SD)	10.0 (1.3)	10.4 (1.4)	*
Grade level, M (SD)	4.7 (1.4)	4.9 (1.3)	NS
Number of siblings, M (SD)	3.95 (2.7)	2.83 (2.1)	*

† M indicates mean; SD, standard deviation; and NS, nonsignificant.

* $p < 0.05$.

comparison group was 69.4% ($n = 129$ families). The lower response rate is likely attributable to less frequent contact with these families. Full details on the intervention evaluation are published elsewhere.³⁴⁻³⁶

An attrition analysis was conducted to determine if the characteristics of the fathers and sons who completed the posttest ($N = 287$ families) were similar to or different from the 17% of father and sons who did not complete the posttest ($n = 60$ families). Logistic regression analysis revealed that fathers with more than a high-school graduation were more likely to complete the posttest than those with less education (odds ratio [OR] = .40; confidence interval [CI] = .17, .95). In addition, fathers who lived with their sons longer before becoming nonresident fathers were also more likely to complete the posttest (OR = 1.39; CI = 1.01, 1.82). Sons who lived with their fathers at some point were more likely

to complete the posttest (OR = 2.03; CI = 1.01, 4.06). Sons who reported better communication with their fathers were less likely to complete the posttest than those with worse communication (OR = .89; CI = .78, 1.00).

Sample Description

Demographic data for the fathers and sons are provided in Table 1. The results are based upon data from the eldest son in the family if more than one son participated. There were significant differences in the education of fathers, the length of time fathers lived with sons, the age of the son, and the sons' number of siblings. Comparison group fathers had more education (χ^2 (5, $N = 287$) = 5.86; $p < .05$) and lived with their son longer (χ^2 (5, $N = 287$) = 10.27; $p < .01$) than intervention group fathers. Comparison group sons were older ($t(285) = 2.58$; $p < .05$) and intervention group sons had more siblings ($t(285) = 3.91$; $p < .001$).

These variables were included as covariates in multivariate analysis.

Intervention Procedures and Implementation

The procedures for development and implementation of the Fathers and Sons intervention have been reported elsewhere.³⁴⁻³⁶ In summary, Fathers and Sons was developed by using a community-based participatory research approach.⁴⁷ The intervention lasted 45 hours during a 2-month period. In total, 77.2% of fathers and 79.6% of sons attended 11 or more of the 15 sessions, demonstrating a high level of engagement. The intervention included activities designed to enhance knowledge, influence attitudes, and practice skill-building in specific content areas (e.g., culture; parent-child communication; parental monitoring; role modeling; social support and networking; preventing or reducing substance use, violent behavior, and early sexual debut). All sessions focused directly or indirectly on improving father-son relationships. Three sessions addressed physical activity (sessions 4, 12, and 13). Sessions 4 and 12 addressed the importance of physical activity for health and provided structured time for fathers and sons to engage in physical activity at a recreation center. Session 13 included African cultural practices (African drum and dance) as communication and health promoting strategies for physical and mental well-being. The Fathers and Sons Program has a specific focus on African-American culture and is rooted in the historical and cultural experiences of Africans and African-Americans because incorporating a cultural approach is often useful for prevention interventions for African-American youth^{48,49} and was seen as an important aspect of the intervention by pilot study participants and the steering committee. The study was approved by the university's institutional review board.

Measures

Table 2 provides information about the items and scales used, including the range of scores; the reliability of scales; and means and standard deviations of responses at pretest and posttest. Detailed information about the measures is included below.

Table 2
Structural Equation Model Components, Ranges, Reliabilities, Means, and Standard Deviations

Latent Variable	Scale or Item	No. of Items	Range	Cronbach α		Mean (SD)	
				Pre	Post	Pre	Post
Fathers' quality of relationship with sons	Parent-child communication	8	10–32	0.615	0.710	24.277 (3.585)	24.969 (3.905)
	Father's closeness with son	1	1–4	–	–	3.532 (0.624)	3.623 (0.546)
	Father meets son's needs	1	1–4	–	–	3.090 (0.682)	3.255 (0.609)
Fathers' intention to exercise	Behavioral Belief	1	1–4	–	–	3.693 (0.558)	3.366 (0.983)
	Evaluation of Outcome	1	1–4	–	–	3.920 (0.351)	3.634 (0.917)
	Normative Belief	1	1–4	–	–	3.283 (0.747)	3.459 (0.793)
	Motivation to Comply	1	1–4	–	–	3.092 (0.912)	3.634 (0.917)
Sons' intention to exercise	Behavioral Belief	1	1–4	–	–	3.580 (0.779)	3.734 (0.597)
	Evaluation of Outcome	1	1–4	–	–	3.823 (0.566)	3.875 (0.479)
	Normative Belief	1	1–4	–	–	3.749 (0.646)	3.822 (0.503)
	Motivation to Comply	1	1–4	–	–	3.704 (0.698)	3.718 (0.615)

Intentions to Exercise. According to the theory of reasoned action, behavioral intentions are informed by attitudes and subjective norms⁵⁰; as such, we constructed four items to measure these constructs from the procedures specified by Ajzen and Fishbein.³⁷ To measure fathers' and sons' attitudes about exercise, we assessed their behavioral beliefs about exercise and their evaluation of the outcome of that behavior. "Exercising is a good time for me to spend with my [father/son]" is an assessment of behavioral beliefs, in this case, that the time fathers and sons spend together exercising is valued. The outcome of this behavior—spending time together—is assessed with the item "spending more time with my [father/son] is good for our relationship." Participants also responded to two items to assess their subjective norms about physical activity: "my [father/son] thinks that it is good for me to exercise" (normative belief); and "when it comes to exercise, I want to do what my [father/son] thinks is good for me" (motivation to comply). These items were designed to capture intentions for exercise within the context of the father-son relationship. Responses to these items were on a four-point scale ranging from 1 (strongly disagree) to 4 (strongly agree). The latent variables measuring fathers' and sons' intentions to exercise (at pretest and posttest) used in the analysis include each of these items.

Quality of the Father-Son Relationship. Fathers' perceptions of the quality of their relationship with their sons were assessed by measuring perceptions about the ease of their communication, their emotional closeness, and the ability of the father to meet the son's needs. The Barnes and Olson Communication Scale (as reported in Forehand et al⁵¹) measured parent-child communication. An example item from this scale is "My son and I can talk about anything." The four-point response scale ranged from 1 (strongly disagree) to 4 (strongly agree). Higher scores indicated better communication. Cronbach α for the communication scale at pretest and posttest was .615 and .710, respectively. We measured perceived closeness between fathers and sons at pretest and posttest by using a four-point scale ranging from 1 (never) to 4 (all of the time) in response to the question "How often do you feel close to your son?" Fathers' perceived abilities to meet sons' needs were assessed by using the same four-point scale and the question "How often do you feel you give [your son] what he needs?" Thus, the latent variables measuring fathers' perceptions about the quality of their relationship with their sons were composed of three items: their communication score, their assessment of closeness, and their assessment of meeting their son's needs.

Frequency of Father-Son Contact. Frequency of father and son contact was

measured by using the item that asked fathers "How often do you usually see your son?" Response categories were as follows: 1 = never, 2 = less than once a year, 3 = a few times a year, 4 = a few times a month, 5 = at least once a month, 6 = 2 to 3 days a week, 7 = 4 to 6 days a week, and 8 = every day. It is included as a single-item indicator.

Data Analysis Strategy

Structural equation models (SEMs) were used to test intervention effects. Three basic steps were used to develop the SEMs.⁵² First, the model was specified from theory and prior research. Alternate specifications were also discussed. Model identification was assessed via the measurement model and the next step was to estimate the full structural models and evaluate model fit. These models included all variables (latent and measured) and tested the hypotheses of interest. Where the fit was inadequate, the model was respecified based on relevant theory and empirical evidence. When model fit was assumed to be adequate, the parameter estimates were reviewed and interpreted. Where appropriate, nonsignificant paths were removed and the model was reanalyzed and evaluated for improvements in model fit. Finally, alternative models were also considered, specified, and evaluated for fit. Error variances for corresponding pretest and posttest measures were correlated in all tested SEMs.⁵³ Per convention, to take into account the expected relationship be-

Table 3
Correlations Among Intervention Group, Father Measures, and Sons Measures*

	1	2	3	4	5	6	7	8	9
1. Intervention group	–								
Father measures									
2. PA intentions – Pre	–0.313	–							
3. PA intentions – Post	–0.178	0.425	–						
4. Quality of relationship – Pre	–0.186	0.503	0.253	–					
5. Quality of relationship – Post	–0.014	0.335	0.397	0.664	–				
6. Contact with son – Pre	0.088	–0.041	0.057	0.367	0.381	–			
7. Contact with son – Post	0.195	–0.041	0.054	0.243	0.500	0.595	–		
Son measures									
8. PA intentions – Pre	0.002	0.190	0.080	0.151	0.065	0.006	0.025	–	
9. PA intentions – Post	–0.011	0.133	0.326	0.145	0.377	0.132	0.148	0.381	–

* All correlations that are equal to or larger than 0.118 or equal to or smaller than –0.118 are significant at the 0.05 level. PA indicates physical activity.

tween the same variable measured at different time points, pretest and posttest regression weights were constrained to equality for corresponding variables in all models.⁵¹ Father and son variables included as covariates were controlled for in the analysis. A variable for intervention group (1 = intervention group; 0 = comparison group) was included to test the effects of the intervention. The SEMs were estimated by using AMOS 20.0 (IBM Corporation, Armonk, New York).

The final sample for this analysis includes families with a pretest and posttest for fathers and sons (in the same family). Skipped questions or unavailable responses led to missing data. Previous analysis³⁶ suggests that the patterns of missing data in this sample are likely to be missing at random. As a result, expectation maximization was used to create a data set without missing values and these imputed data were used by the AMOS program. Maximum likelihood estimation was selected as the estimation method because of its consistency in estimating parameter values and its ability to provide unbiased and sufficient estimates.⁵⁴

Three fit indices were used to determine the adequacy of model fit: the χ^2 statistic, the comparative fit index (CFI), and the root mean squared error of approximation (RMSEA). The indicators of adequate model fit for these indices (i.e., that the specified model fits the sample data well) are a nonsignificant χ^2

statistic or a χ^2 to degrees of freedom (df) ratio of less than 2; a CFI above .90; and a RMSEA value of .05 or less.^{52,55}

RESULTS

Chi-square tests of association and two-sample *t*-tests were used to compare the demographic characteristics of the intervention and comparison groups at baseline (see Table 1). Statistically significant differences were controlled for in the analysis. Bivariate associations among variables were estimated by using the Spearman rank correlation coefficient (Spearman's Rho) and are reported in Table 3. Spearman's rho is suitable for assessing the magnitude and direction of association between variables that are not normally distributed, as it has a higher robustness than the Pearson product-moment correlation coefficient in the presence of outliers or skewed distributions.^{56,57} These low to moderate correlations demonstrate evidence of modest relationships among fathers' and sons' variables at pretest and posttest.

SEM Model: Fathers' Influence on Sons' Intentions to Exercise

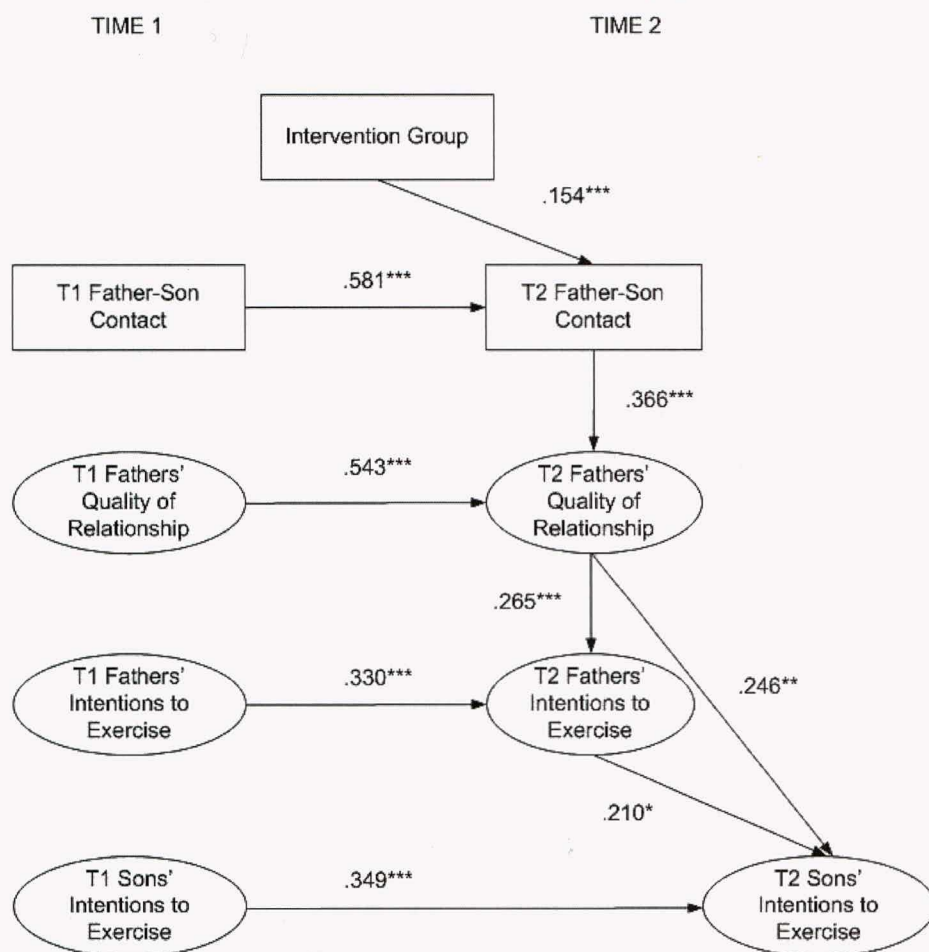
The measurement model indicated that the model fit the data well ($\chi^2/df = 1.508$; CFI = .924; RMSEA = .042). The standardized factor loadings for the fathers' quality of relationship latent variable ranged from .478 to .641 at pretest and from .569 to .635 at

posttest. The standardized factor loadings for the fathers' intention latent variable ranged from .358 to .644 at pretest and from .196 to .805 at posttest. The factor loading of .196 did not result in the exclusion of this indicator (motivation to comply) from the latent factor because of theoretical basis for the inclusion of this item.⁵⁸ The standardized factor loadings for the sons' intention latent variable ranged from .666 to .833 at pretest and from .524 to .661 at posttest.

The full structural equation model is represented in the Figure. These results present the standardized coefficients. The model fit was good ($\chi^2/df = 1.440$; CFI = .929; RMSEA = .039). The standardized factor loading for the fathers' quality of relationship latent variable ranged from .485 to .618 at pretest and from .581 to .635 at posttest. The standardized factor loadings for the fathers' intention latent variable ranged from .474 to .647 at pretest and from .202 to .815 at posttest. The standardized factor loadings for the sons' intention latent variable ranged from .664 to .837 at pretest and from .583 to .662 at posttest.

The path from the group to the fathers' report of contact with the sons was positive and significant ($B = .154$; $p = .001$), indicating that fathers in the intervention group reported more frequent contact with their sons at posttest after controlling for the contact between fathers and sons at pretest. The model further indicated that this

Figure
Fathers' Influence on Sons' Intentions to Exercise



Model fit: $\chi^2 = 462.174$; $DF = 321$; $CMIN/DF = 1.440$; $CFI = .929$; $RMSEA = .039$. * $p < .05$ ** $p < .01$; *** $p < .001$. DF indicates degrees of freedom; CMIN/DF, chi-square to degrees of freedom ratio; CFI, comparative fit index; RMSEA, root mean squared error of approximation; T1, time point one; and T2, time point two.

contact is associated with an increase in fathers' perceptions of the quality of their relationship with their sons ($B = .366$; $p < .001$). The positive and significant path from fathers' perceptions of the quality of the relationship to both father and son intentions to exercise demonstrated that improving the quality of the father-son relationship, as perceived by fathers, was associated with positive changes in the fathers' intentions to engage in physical activity ($B = .265$; $p = .001$) and the sons' intentions to exercise ($B = .246$; $p = .005$). Finally, improving fathers' intention to engage in physical activity

was associated with an improvement in sons' intentions to engage in physical activity ($B = .210$; $p = .012$).

We tested alternate models by adding direct paths from the group to fathers' quality of relationship, fathers' intentions to exercise, and sons' intentions to exercise at time point 2. Since the added paths were not significant, and the fit of the model was not improved, these paths were not included in the final structural model. To test the mediation suggested by our findings, we used a bootstrapping procedure in AMOS to estimate and test (1) the indirect effect of the

intervention on fathers' perceptions about relationship quality; (2) the indirect effect of the intervention on fathers' intentions to exercise; and, (3) the indirect effect of the intervention on sons' intentions to exercise. All of the indirect effects were statistically significant ($p = .010$, $p = .039$, and $p = .017$, respectively) and all of the direct effects of the intervention on the mediating variables were not statistically significant, indicating a full mediation effect.^{59,60} These results support our hypothesis that the effects of the intervention on fathers' intentions to exercise are mediated by changes in father-son contact and fathers' perceptions about relationship quality. These results also support our hypothesis that the intervention would not have a direct effect on sons' intentions to exercise, but rather, the intervention had an indirect effect on sons' intentions to exercise through father-son contact, fathers' perceptions about relationship quality, and fathers' intentions to exercise.

DISCUSSION

The purpose of this study was to test the effects of the Fathers and Sons intervention for improving sons' intentions to engage in physical activity. A central and unique feature of this study is the exploration of the role of nonresident African-American fathers in supporting the health of their sons. Overall, we found that the intervention was successful in improving sons' intentions to exercise. As we hypothesized, frequency of contact, relationship quality, and fathers' own intentions to exercise were mediating factors. The intervention did not have a direct influence on relationship quality or exercise intentions; rather, the intervention's success in increasing contact among fathers and sons was a precursor to the observed improvements in relationship quality and the positive influence of relationship quality on sons' exercise intentions. In addition, the results indicated that the intervention had a positive effect on fathers' own intentions to engage in physical activity. The intervention's effects on fathers' intentions to exercise were a result of improvements in

the frequency of contact between fathers and sons, which had a subsequent positive, direct effect on fathers' perceived quality of relationship with their sons. In turn, fathers' intentions to exercise positively influenced sons' intentions to exercise.

Recent evidence suggests that over the last few decades, contact between nonresident fathers and children has increased.⁶¹ In addition, African-American nonresident fathers may be in contact with their children more than those of other races.⁶² While our results support efforts to increase interactions among nonresident fathers and sons, our data also suggest that contact alone is not enough to positively influence sons' outcomes. Amato and Gilbreth⁴⁴ note that contact is often used as a proxy for relationship quality among fathers and children; however, research indicates that contact is better viewed as a necessary but insufficient condition for developing close relationships. As evidence continues to mount regarding the importance of father involvement for child health outcomes,⁶³⁻⁶⁵ we would caution that interventions must do more than just remove barriers to contact between nonresident fathers and sons. A strength of family-based interventions such as the Fathers and Sons Program is that in addition to providing an opportunity for nonresident fathers and sons to interact, there is a focus on building and maintaining the relational factors in parent-child interactions—such as good communication and closeness—which seem to be more proximal determinants of child well-being. Qualitative data from studies of nonresident African-American fathers suggest that many of these men have a strong desire to be a central influence on the socioemotional development of their sons, despite barriers they may face in enacting the father-provider role.⁶⁶

Indeed, scholars have called for more research that explores how relational factors between adolescents and parents, especially among ethnic minority families, influence positive adolescent health behaviors such as physical activity within the context of theory-based intervention programs.^{67,68} Notably, the Fathers and Sons Program addresses that call, and

the implications of this work are quite remarkable. African-American men in the United States are disproportionately burdened by a number of chronic diseases and have decreased life expectancy, compared to their white counterparts.³⁰ Health attitudes and behaviors that contribute to chronic disease and mortality are shaped over the life course,⁶⁹ and encouragingly, our findings suggest that positive improvements to the physical activity intentions of both African-American men and their sons can be observed with appropriate intervention at the family level.

Given the previously mentioned racial disparities in physical activity engagement among adolescents,⁹⁻¹¹ it will be useful to consider how our results might help to further our understanding of that disparity. First, it would not be prudent to argue that African-American adolescents are less engaged in physical activity than their white counterparts because of differences in their relationships with their fathers. While doing so might bring important attention to the role of family relationships in influencing behavior, without appropriate context, this argument is myopic, at best. African-Americans in the United States are more likely than whites to live in neighborhoods that may not have resources that support physical activity,⁷⁰ such as recreational facilities,⁷¹ or have barriers to physical activity such as crime.⁷² In addition, African-American parents may be more likely than white parents to perceive barriers to their children's participation in physical activity.⁷³ Family-level changes in intentions to exercise, such as observed in this intervention study, would likely be best sustained—and be better predictors of actual behavior—within environments that are also conducive to physical activity. A continued consideration for research and intervention would be to address barriers to physical activity among African-American males who intend to exercise.^{74,75}

Furthermore, the Fathers and Sons intervention focused specifically on nonresident African-American fathers and sons, and thus, we cannot assume that these findings would be replicated if the intervention was conducted with resident fathers and sons. Future re-

search comparing the effectiveness of interventions among resident versus nonresident African-American fathers and sons could deepen our understanding of parental influences on physical activity among African-American adolescents. It could be the case that for African-American fathers and sons who live in the same household, availability could be more useful to address than accessibility, but that for both types of family structures (resident and nonresident fathers) the quality of the relationship remains a key pathway for improving physical activity outcomes,⁷⁶ and a culturally appropriate intervention would still be useful.^{47,48} From a developmental perspective, it appears that early adolescence would likely remain an opportune time for this type of intervention regardless of the family residency status. Adolescence is recognized as a time when parent-child relationships undergo a transition and for some, this relationship may become tenuous.⁷⁷ As children age and become more independent, they may develop strained relationships with parents who engage in behaviors that the child perceives are limiting their autonomy.⁷⁸ Strengthening ties between nonresident fathers and sons during early adolescence could benefit the well-being of sons as they make the transition to later adolescence and adulthood.⁷⁹

Limitations

Despite the strengths of this study, there are limitations to consider. First, there was no direct measure of physical activity engagement among study participants. A direct measure of physical activity, including the type, intensity, or duration of the activity, could have furthered our understanding of how role modeling (i.e., father modeling physical activity for son) influences sons' engagement in physical activity and helped us to understand how their engagement might influence their health outcomes.^{80,81} However, given the evidence that behavioral intention is a reliable predictor of future behavior,^{38,82} our findings suggest that the pathways linking nonresident father and son outcomes in this study would likely contribute to observed physical activity levels. Furthermore, our study

did not include parental behaviors typically associated with adolescent physical activity outcomes such as monitoring television watching and encouraging physical activity.^{43,83} It is possible that our measure of relationship quality (i.e., communication and closeness) captures these types of activities; however, should that not be the case, it would be worthwhile to consider that general improvements in communication and closeness could contribute to improved health outcomes for sons.

CONCLUSION

This research supports the idea that family-focused interventions with non-residential African-American fathers can play a critical role in improving intentions to engage in health-promoting behaviors such as physical activity. Our analysis suggests that health practitioners and service providers could focus on assessing the quality of the relationship between nonresidential African-American fathers and their sons and encourage participation in programs seeking to improve their physical activity intentions as a family as part of healthy lifestyle goals. Programming that promotes healthy parent-child communication and emotional closeness could also prove worthwhile. These data also suggest that it will be important to collaborate with services to decrease barriers to nonresidential father-son contact to be most effective. Previous research has indicated that the accessibility of fathers (i.e., availability and frequency of contact) can positively influence adolescent health, but contact alone may not be sufficient. Thus, efforts to promote regular contact between fathers and sons, along with improving the quality of their relationship once contact has been established, are recommended. Lastly, it is important to acknowledge that this intervention was designed to be culturally and developmentally appropriate for this population, and attention to these issues likely played a role in the observed outcomes.

There are many additional avenues for future research. First, a direct assessment of parental monitoring of

physical activity by nonresident fathers could shed more light on how these fathers influence the physical activity intentions of their sons. A consideration of the home and community environment in these assessments could help to identify factors that help to support or hinder physical activity. Second, it would be useful to assess the role of contact and relationship quality on actual levels of physical activity/inactivity. Such research would likely benefit from an appreciation of the contextual factors that may influence the predictive value of intentions to exercise on actual behavior. Third, researchers could also explore if relationship quality affects the type of activities (physical activities and non-physical activities) that nonresident fathers and sons engage in together and how nonresident father-son activities influence intentions to exercise and exercise behaviors. Finally, the issue of coparenting with the mother in this area cannot be ignored.

SO WHAT? Implications for Health Promotion Practitioners and Researchers

What is already known on this topic?

Physical activity during childhood and adolescence is an ongoing public health concern. Parents play a key role in influencing exercise behaviors of their children.

What does this article add?

This study describes mechanisms that influence how nonresident African-American fathers influence the physical activity intentions of their sons. This is particularly important given the poorer health outcomes observed among African-Americans for which physical inactivity is a risk factor.

What are the implications for health promotion practice or research?

Given the high prevalence of single-mother-headed homes in the African-American community, and the importance of physical activity across the lifespan, this information can be useful for promoting physical activity among African-American boys in programs and interventions. Future research can explore whether these findings also hold with resident African-American fathers and boys.

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