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Feasibility and Preliminary Findings of a Church-Based Mother-Daughter Pilot Study Promoting Physical Activity Among Young Latinas

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Physical activity (PA) rates in young Latina girls are low. This study examined acceptability and feasibility of implementing a mother-daughter intervention targeting individual and family-level correlates of PA. Eleven mother-daughter dyads participated in an 8-week intervention promoting PA in preadolescents. Preliminary data suggest increases in self-report PA, reductions in television watching, and improvements in parenting and mother-daughter communication. Focus group data suggest that participants benefited from receiving the intervention in a group format. Findings suggest that mother-daughter interventions promoting PA in young Latinas are feasible. Physical activity may improve family communication and mother-daughter relations. **Key words:** *Hispanic/Latino, mother-daughter intervention, physical activity, youth*

NATIONAL DATA suggest that only 15.6% of Hispanic/Latino children engage in at least 60 minutes of physical activity (PA) a day and Hispanic girls (10.5%) engage in even less activity than Hispanic boys (20.7%).[1] Consistent with these trends, Hispanic girls are less likely to participate in sports programs and are more sedentary than Hispanic boys and non-Hispanic girls.[2] Moreover, on average, adolescents spend more than 4.5 hours in front of screens each day (television [TV], computer, handheld devices), and watching TV accounts for 2.5 of those hours alone.[3] Physical activity rates decrease significantly when Hispanic girls reach adolescence[4] which warrants the need to implement interventions that promote PA and reduce sedentary during this critical period.

Preadolescence and adolescence mark a period of emotional and physical changes for youth, especially among girls. During adolescence, depression increases, self-esteem decreases, and body dissatisfaction increases.[5,6] One way to ameliorate the negative impact of these changes on girls' emotional and physical development is through PA.[7,8] Physical activity can encourage the healthy growth of children's bodies and help to maintain a healthy weight. Children who are active tend to feel more confident, have improved self-esteem, manage stress and anxiety better, and have improved learning outcomes than children who are less active.[7] Furthermore, physically

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active children are more likely to avoid unintended pregnancies and are less likely to drop out of school.[9]

Family-based interventions are effective for promoting youth health practices, and those that incorporate training on parenting skills, child management, and family functioning show positive effects on child weight loss.[10] Parents have a strong influence on the health practices of young children. Mothers, in particular, influence their children's activity levels by creating and supporting PA opportunities (eg, enrolling them in dance classes and recreational sports), reducing access to sedentary practices, modeling PA, and reinforcing children's efforts to be physically active.[11,12] Involving Latino mothers and their daughters in a health promotion program is ideal because Latino culture is characterized as having a strong sense of attachment to immediate and extended families[13] and family members prioritize the family's needs over individual ones.[14,15]

Despite the benefits of PA and the low rates of PA among Latina youth, few mother-daughter PA interventions exist[16-23]; and only one has involved young Latinas.[19] Interventions involving preadolescent daughters appear promising. Beech et al[16] examined the impact of a 12-week intervention promoting nutrition and PA among African American girls aged 8 to 10 years and their mothers. Study findings show an 11.7% increase in minutes of moderate-to-vigorous physical activity as assessed by accelerometer relative to the comparison group. In a separate study involving Caucasian preadolescent girls and their mothers, Ransdell et al[22] found that participants in the PA intervention increased their average step count by 37%, whereas the control group declined by 13%. In a study involving Latina preadolescents, mother-daughter dyads participated in a 12-week intervention aimed to improve preadolescent Latinas' PA through nutrition education; counseling about healthy living; and exercise classes in school settings, community centers, and parks.[19,20] The comparison condition received educational written materials and a light PA intensity dance (eg, samba) or sports sessions. Following completion of intervention activities, there were slight increases in accelerometer-based PA among preadolescents in the intervention (9%) and comparison (7%) conditions, but no significant differences by condition.

Interventions promoting physical health in churches complement churches' existing focus on spiritual health and well-being, thereby enabling them to provide a more holistic approach to wellness (mind, body, and soul). In addition to their infrastructural resources (eg, meeting spaces, safe place to be active), many churches have systems of volunteers in place who can provide social support for adopting and maintaining new health behavior changes.[24] Numerous health promotion researchers[25-31] and national surveys highlight churches as ideal settings for Latino-focused health promotion programs because they have wide reach into the community. Sixty-eight percent of Latinos identify as Catholic and close to 42% of Latino Catholics report attending church at least weekly.[32] Churches with large Latino membership often offer family catechisms and classes for *quinceañeras*—events in which both mothers and daughters are required to participate.[33] Because of the growing recognition that spiritual beliefs are strongly linked to health practices and beliefs about disease, health promotion programs that are tailored to these beliefs are likely to be more effective.[34]

Only 1 church-based study included Latino youth, and it focused on violence prevention rather than improving PA or healthy eating behaviors.[35] Thus, church-based programs to promote PA among young Latinas are needed. To address the gaps in health promotion research, the first goal of the study was to examine the acceptability and feasibility of a pilot study promoting PA in young Latinas in a church-based setting. Because the majority of PA interventions involving youth have been implemented in schools[36] and other community settings, study results will shed light on the appropriateness of conducting the proposed program in a church setting. The second goal of the study examined the preliminary efficacy of the intervention on the PA and correlates (individual and family

levels) of PA of Latina preadolescents and their mothers. Results from the pilot will inform randomized controlled trials aimed at addressing health disparities among Latinos.

METHODS

Church and participant selection

The participating church was selected because it had 2 Spanish-language mass services, no existing PA programs for youth, and its leadership expressed willingness to participate in the program for the duration of the intervention. The church, which is of Catholic denomination, is located in the city of Chula Vista, California, the second largest municipality in San Diego County. Resident population in Chula Vista is predominantly Latino (>50%).[37]

At the time of selection, the church had 1800 enrolled parishioners (48% Latino). Study participants consisted of a convenience sample of Latina mother-daughter dyads who attended church services at least twice per month. Participants were recruited by study staff and church leaders and occurred prior to and following church services via announcements in Spanish from the pulpit and through flyers distributed after church services. To be eligible, mothers had to have a daughter between the ages of 8 and 12 years who did not have a medical condition that would preclude daughters from engaging in PA. The first 11 mother-daughter dyads that met eligibility were invited and enrolled in the study. Consent was obtained from mothers and assent from daughters prior to administering the preintervention survey assessing parenting styles, attitudes, and behaviors related to daughters' PA. The study protocol was approved by the San Diego State University institutional review board.

Intervention

The intervention was informed by data from 2 focus groups collected from 8 mother-daughter dyads attending the same church. The purpose of the focus groups was to explore general themes (eg, communication, PA support) that would be relevant to address in the mother-daughter intervention. The 2-hour focus groups, which were held 11 months before the pilot study was implemented, were moderated, transcribed, and coded independently by the principal investigator (PI) and a research assistant. Themes were compared between coders and discrepancies were reconciled. Themes from the focus groups were then extracted to inform the development of the mother-daughter intervention which was also informed by 2 theories: Social Cognitive Theory (SCT) and Family Systems Theory.[38,39] Social Cognitive Theory is based on the assumption of reciprocal determinism, noting that behavior, as well as cognitive and other personal and environmental factors, all interact and influence each other. Taking into account constructs relevant to SCT, factors like *self-efficacy* for encouraging daughters to engage in PA, *self-control*, and *behavioral capability* were targeted through setting realistic, attainable goals to increase PA, engaging the preadolescents in PA (including warm-up, moderate activity, and cool-down), which enhanced their skills. We targeted *observational learning* by involving a credible Latina (exercise physiologist) to model PA and by engaging the preadolescents' mothers in PA. We took into account *reinforcement* by addressing parenting skills and encouraging mothers to reward their daughters when attaining PA goals. *Environment* was targeted by encouraging parents to allow their daughters to play with their friends. In addition, we addressed *emotional coping responses* by encouraging parents to use PA as an outlet when experiencing stressful situations or depressive symptoms.

In addition, the concept of family reciprocal determinism was developed with a focus on the complexities existing between the individual and the family unit and how the 2 influence each other when determining behavior change.[40,41] According to SCT, the system closest to the individual is the family unit, thus requiring the consideration of Family Systems Theory[39] to understand factors that influence family members' health practices. In this study, the family-level dimensions

targeted were parenting promoting PA (monitoring, reinforcement, discipline), parental support for PA, parental policies promoting PA, and communication (eg, discussing difficult topics). Following completion of the intervention development, a church leader (a Catholic nun) provided input on the themes and religious content of the manual.

The 8-week intervention was implemented in a room adjacent to the participating church. Participating mothers and daughters attended weekly sessions on Saturday mornings, lasting approximately 2.5 hours. Each lesson consisted of educational topics, utilized interactive activities to reinforce educational components, incorporated religious themes related with health, and provided opportunities for preadolescents to engage in PA (Table 1). Each session began with a prayer, which was often led by the priest. Mothers and daughters were then separated into groups. The mothers' sessions were co-led in Spanish by the PI and a *promotora* (lay health advisor) who was affiliated with the church and employed by the study. The preadolescent sessions were co-led in both Spanish and English by 2 youth leaders (one in college and the other in high school who was affiliated with the church). Prior to the start of the intervention, the 2 youth leaders received training from the PI and the *promotora*. The group leaders and the PI met on a weekly basis to discuss the intervention strategies that worked and did not work, problem-solve any issues that needed to be addressed, and plan for upcoming sessions. These meetings included role-playing different aspects of the curriculum sessions and receiving feedback on how information was presented.

Following prayer at the start of each session, mothers and daughters were separated into 2 groups. The mothers' sessions involved group discussions and interactive activities to engage participants in the health information outlined in the curriculum (Table 1). While the daughters' sessions included information on the same topics, the delivery of information differed from that of the mothers' sessions. The daughters' sessions involved some group discussions but also included interactive games and activities (eg, jeopardy-style games) to reinforce the health information. Another difference was that during the second part of each session with the daughters, a Latina graduate student with a background in exercise physiology demonstrated exercises, proper warm-up and cool-down, and engaged the daughters in PA by organizing various games that involved moderate to vigorous activity for at least 20 minutes. Examples of activities included jumping rope, playing tag, and running.

To target family level variables that would promote girls' PA (eg, reinforcement of PA), program activities for both mothers and daughters targeted effective parenting and communication skills. Another activity that aimed to facilitate mother-daughter communication involved asking the daughters to list the top 3 topics that were difficult to discuss with their mothers (eg, bad grades, boys, etc). The topics were presented to the mothers during the group discussions where they had an opportunity to talk about effective ways to address these topics. Between Saturday group sessions, mothers and daughters were encouraged to take walks together, which encouraged them to do PA together and to improve their communication.

The last session of the series involved preadolescents taking pictures of environmental factors that facilitated and inhibited their PA. The preadolescents presented the pictures in a format similar to photovoice to the priest and their mothers. This activity provided the preadolescents with an opportunity to present solutions to some of the barriers they identified in the pictures. At the end of the 8 weeks, the mother-daughter pairs received a certificate of completion from the priest and group leaders.

Measures

Surveys were administered to mothers and daughters at the beginning of the first session and end of the last session of the 8-week program. The surveys were self-administered; however, program staff were available to provide assistance if needed,

Table 1. General Themes of the 8-Week Mother-Daughter Curriculum

Session Theme	Mothers	Daughters
1. Introduction to program	PA as a healthy integrating faith into daily life Preadolescents' development	Benefits of PA game PA safety and hydration Faith and health
2. Physical activity	Differences between light, moderate, and vigorous PA Myths and facts about PA PA guidelines	Differences between light, moderate, and vigorous PA game Myths and facts about PA PA guidelines
3. Motivation and barriers to PA	Identify and address barriers to daughters' PA	Identify and address individual and environmental barriers to PA Motivation and PA
4. Parenting/ connecting with family members	Effective parenting styles Improving family relationships Connecting with teachers and catechists	Roles of people who help us including parents, teachers, and catechists Improving communication with adults
5. Family communication	Effective communication Cultural gaps in communication between daughters and mothers Discuss difficult topics	Discuss difficult topics Barriers to communication
6. Accessing community resources and modifying the home environment	Community resources that facilitate physical activity Making the home environment physical activity friendly and reducing opportunities for sedentary behavior (eg, limiting television [TV] watching)	Community resources that facilitate physical activity Making the home environment physical activity friendly
7. Nutrition	Benefits of eating fruits, vegetables, grains, and meats Portion control Healthy cooking strategies and snacking	Benefits of eating fruits, vegetables, grains, and meats Portion control Healthy cooking strategies and snacking
8. Photovoice components	N/A	Discuss solutions to the problems identified

especially for the daughters. All measures not available in Spanish were translated and back translated. Survey readability was assessed using the SMOG (Simple Measure Of Gobbledygook) technique assuring it did not exceed a third grade reading level.

Measures pertaining to the preadolescents

Girls' PA and amount of TV watching per week (parent completed). Mothers were asked to recall the number of hours per week their daughters engaged in various activities that involve moderate levels of intensity such as cycling, walking, swimming, gymnastics, dancing, and tennis. They also were asked to report the number of hours their daughters watched TV per week.

Girls' attitudes toward PA and TV. This 28-item scale was taken from the larger SPARK Student Survey to assess children's attitudes about various activities. The first section

(facial expressions) asks youth to identify their attitudes about activities that make them tired such as walking, physical education, and running. The 6 responses range from a smiley face to a sad face. The second section assesses youth's attitudes toward TV watching. The responses are adjectives that are positive or negative (complementary attitudes).[42]

Girls' perception of PA support. This 6-item scale, developed by Sallis et al,[43] measures the impact of social support given by family and friends on decisions regarding diet and exercise. This measure has good internal consistencies (α = 0.61-0.91). Castro et al.[44] reported an internal consistency of 0.75 when tested on a female population (n = 125, 45.3% Latina).

Measures pertaining the mothers

Mothers' PA and amount of TV watching per week. Mothers were asked the number of hours they engaged in various activities including cycling, walking, swimming, gymnastics, dancing, and tennis. Similarly, mothers were asked in an open-ended format the number of hours they watched TV per week.

Mothers' report of parenting styles relating to healthy eating and PA. The Parenting Strategies for Eating and Activity Scale (PEAS) is a 26-item scale that assesses parenting strategies surrounding children's eating and PA behaviors at home (α = 0.73-0.87).[45] Only monitoring, discipline, and reinforcement subscales pertaining to PA were included. Response options range from "never" to "always" and "agree" to "disagree."

Parent self-efficacy to do PA with daughter. This 5-item scale assesses a parent's self-efficacy to do PA with his or her child.[46] It asks the mother to rate how hard it would be for them to encourage their daughter to be physically active instead of watching TV, encourage their daughter to walk with the mother, engage in PA with their daughter every week, take their daughter to the park, and walk with their daughter (α = 0.69). Response items range from 1 (*very hard*) to 4 (*not hard at all*).

Parental PA policies. This 5-item scale asks mothers how often they encourage their child to be physically active, transport their child for PA, send their child outside to play, give their child opportunities for PA, and praise their child for being physically active.[47] The scale has demonstrated adequate reliability (α = 0.87).

Sociodemographic characteristics. Mothers were asked to provide information about their age, marital status, education, nativity, years living in the United States, income, and their own height and weight, as well as their daughters' place of birth, age, and their grade in school.

Self-report BMI (parent). Mothers were asked to report their height and weight at baseline only.

Process evaluation

Attendance was collected at each session. Of the 11 participating mother-daughter dyads, 4 pairs missed 1 session and 1 pair missed 2 sessions. In addition to completing the survey at the end of the program, mothers and daughters were asked separately to provide feedback via survey and a focus group on the themes and activities covered in the program each week. More specifically, mothers were asked how much or how little they enjoyed the following topics and activities: (1) introduction, (2) prayers, (3) reviewing the content covered in previous session, (4) benefits of PA, (5) different types of PA that the daughters would engage in, (6) barriers to PA, (7) parenting styles, (8) jeopardy, (9) family communication, (10) the roles of each family member, (11) the home environment, (12) resources in the community, and (13) the nutrition pyramid. The response items ranged from 1 (*a lot*) to 4 (*not at all*). In addition, there was an open-ended question asking mothers and daughters to list any topics or activities not included that they would have liked to see in the program. Following completion of the survey, the mothers and their preadolescent daughters were invited to participate in a 1-hour focus group that was held at the end

of the last session. The focus group for the mothers was facilitated by the PI and the *promotora* facilitated the focus group with the daughters. The goals of the focus groups were to understand aspects of the intervention that mothers and daughters liked and disliked as well as those that might have impacted relevant theoretical constructs.

Analyses

Of the 11, one mother-daughter pair did not complete the survey following completion of intervention activities because of a family emergency. Means and standard deviation were calculated for the survey questions at baseline and following completion of the intervention activities (n = 10). Given the small number of participants, no significance tests were computed. The mother-daughter follow-up focus group discussions were transcribed in the language in which the focus groups were conducted. The PI and a graduate research assistant used Ethnograph v6 to independently code the transcripts and compare the themes extracted until agreement was achieved.

RESULTS

Demographics

The demographic characteristics of both mothers and daughters were collected in the baseline survey. As noted in Table 2, the majority of the mothers were married and born outside the United States. In comparison, the majority of the preadolescents were born in the United States.

Baseline and postintervention responses

Table 3 shows mean and standard deviation changes at baseline and immediately after the intervention. Following completion of intervention activities, mothers reported an increase in PA hours per week and decrease in the number of hours of TV watching for themselves and their daughters. When examining girls' responses, findings suggest increases of negative attitudes toward TV watching. Also, the girls reported increases in parental support for PA. Similarly, the changes in the mother were in the expected direction with the exception of parental discipline and limit setting.

Table 2. Demographic Table (n = 11)

Demographic	%	M (SD)
Mothers		
BMI		27.17 (4.22)
Married	55.5	
Age		36.67 (6.18)
Employed	44.4	
Completed HS	66.7	
Born in Mexico or other country	88.9	
No. of years in US		13.22 (14.40)
Income ≤ $2000	66.7	
Girls		
Age		9.56 (1.13)
Born in Mexico or other country	11.1	
Grade (4th)	44.4	

Participants' evaluation of the intervention (quantitative results)

With the exception of 1 activity and 1 topic, mothers and daughters rated enjoying all of the topics and program activities "a lot." Among daughters, reviewing previous modules and discussing resources in the community were rated less favorably ("somewhat interesting").

Postintervention focus group data

Physical activity

Throughout the follow-up focus group with the daughters, the participants recalled many of the benefits for engaging in PA that they had learned during the program. While many of the girls stated that before the program they did little to no PA, several agreed that

Table 3. Mean and Standard Deviations of Survey Questions Before and After Completion of Intervention[a] (n = 10)

Preadolescents	**Before**	**After**
No. of PA hours per week	6.25 (3.66)	7.68 (3.76)
No. of TV hours per week	8.77 (5.80)	6.88 (5.96)
Positive attitudes toward physical activity (PA)[b]	2.05 (0.92)	1.97 (1.00)
Negative attitudes toward TV watching[c]	18.22 (3.19)	20.44 (2.65)
PA support[d]	3.25 (0.87)	3.51 (0.94)
Mothers		
No. of PA hours per week	5.00 (5.81)	6.62 (3.72)
No. of TV hours per week	8.00 (6.96)	7.33 (3.60)
PA monitoring[d]	2.88 (0.99)	4.16 (0.70)
PA reinforcement[b]	2.61 (0.78)	2.88 (0.48)
Parental discipline[d]	3.61 (1.08)	3.33 (1.71)
Self-efficacy to do PA with daughter[b]	3.31 (0.80)	3.55 (0.39)
Parental policies promoting PA[c]	3.35 (0.89)	3.72 (0.59)

[a]Values are expressed as mean (SD).
[b]Range 1-4.
[c]Range 1-24.
[d]Range 1-5.

they engaged in more PA with their mothers and friends as a result of the program. One participant stated, "My mom and I do more PA together now, not like before." Another participant stated, "The workshops motivated me to go outside more with my friends." In addition to being more active with their mothers and friends, the girls discussed the health benefits they had learned about PA. Besides weight control, participants acknowledged the effects of PA on circulation, cardiovascular function, muscular strength, and overall health.

Sedentary behavior and TV viewing

When asked about how the program helped to decrease sedentary behavior, one mother responded that she became "conscious of the consequences." Another mother stated, "Right now [my daughter] watches less TV and goes outside more." Another participant, on the contrary, shared a recent fight she had with her daughter over the computer and expressed the need to learn more about setting limits on screen time.

Emotion regulation and coping

The women in the focus group discussed using PA as a healthy way of dealing with depression and emotional distress. One woman said, "I think that depression occurs because you do not have anything to do. Look for something to do if you are depressed. Let's go to the park . . . let's walk." At the same time that the participants discussed their understanding of depression and health, they also said they needed to learn more about how to detect and overcome depression. After several women in the group stated that they consider depression a health problem in their community, one woman suggested learning about "how to handle depression."

Environment and social support

Most of the daughters in the focus group agreed that they would encourage their

friends to participate in a PA program and support one another to be more active. One said she would tell her friends "to come to the program because it is fun and it encourages you to do more PA." Participants also discussed being more motivated to get involved in their community as a result of their participation in the program. Many agreed that they enjoyed having the program in a group setting and that they prefer doing PA with other people, such as friends or their mothers.

Besides doing PA together, the girls also liked doing activities with their mothers. Several participants also mentioned that they liked playing the jeopardy game with their mothers because it was fun and their mothers were helpful and knowledgeable. Many of the mothers stated that they liked having the group sessions together with other mothers. Some of the benefits they derived from the group setting included the ability to share similar experiences and obstacles with one another in a nonjudgmental atmosphere, and to put their experiences into perspective by listening to each other. One woman said that sharing in the group setting helped her to "vent," while another woman said that it made her feel that her feelings had been "validated." Given the importance the participants gave to group interaction, many women expressed desire for more time to get to know and communicate with one another during the group sessions. One woman stated that they "should have integrated more with [one another]" and had more "dialogue."

Family level—parenting

One of the topics discussed solely by the mothers was that of parenting and discipline. Many of the women agreed that parents play an important role in teaching lasting values to their children. Although one mother reported being less authoritarian and becoming more patient with her daughter following participation in program activities, many others expressed the need to learn more effective parenting strategies. While describing the benefit of sharing experiences within a group of mothers, one participant expressed a lack of parenting knowledge by saying that "there's not a book that teaches you how to be a parent." Another mother admitted that she too needed more guidance, "Many times although we are the parents we don't know how to handle the situations that have happened." The mothers' expressions of a general lack of knowledge and resources regarding parenting and discipline in relation to PA indicate a need to learn relevant strategies and further develop these skills.

Family level—communication

The preadolescent daughters discussed learning to communicate more with their mothers as a result of the program, especially regarding PA. Some of the girls also stated discussing the program with their other family members, such as siblings or cousins. One participant stated that she learned how to "maintain communication with [her] mom" and another said that the program motivated her to "chat with [her] mom." Many of the girls agreed that having the program with their mothers was beneficial, but they suggested having more interaction time with their mothers. Some daughters also suggested adding more sessions on ways to communicate with their mothers and other family members, as well as anger management strategies to reinforce these skills.

Faith and religion

Many of the mothers agreed that what they liked most about the program was the integration of faith and God as a source of meaning and inspiration for healthy living. Several participants mentioned the weekly Bible verses as motivation for making healthy choices and creating better communication with their daughters. One woman expressed her satisfaction with the proverbs shared throughout the program.

> What I liked the most about the program was that it was about the mother and daughter, illuminated

in faith. For example, at each part there was a proverb . . . telling you to care for your body as a temple [of God], and there are a lot of proverbs about communication between parents and children, and that's what we need.

While one mother mentioned that the homework assignment to find a relevant proverb was a good excuse to open her Bible and interact with her daughter at home, several others expressed the desire to have a greater integration of faith and religion into the overall program. As one woman noted regarding the homework assignments, "[that it was] an excuse to read the Bible for a little while, looking for something that relates to what we are doing [in the workshops] that also reinforces it."

In the focus group with the daughters, participants also mentioned the benefit of faith and religion in the program. One participant stated that she participated in the program because "it taught us about God." Similar to the recommendations of the mothers, the daughters suggested incorporating more about faith and God into the curriculum.

DISCUSSION

The current study evaluated the acceptability, feasibility, and preliminary efficacy of an 8-week mother-daughter intervention promoting PA among preadolescent Latinas. To our knowledge, this is the first mother-daughter intervention promoting PA in a church setting. Both quantitative and qualitative findings provide preliminary evidence that the intervention may have influenced the PA and sedentary behavior of mothers and daughters. Per mothers' reports, their daughters' PA increased by 97 minutes or 32% following the 8-week intervention. The increases in PA following completion of program activities are consistent with those found in other PA interventions that have been 12 weeks in duration.[21] Parallel to these findings, the mothers' PA also increased following participation in program activities.

Consistent with changes in PA, the preadolescents reported feeling more negative about sedentary behavior following completion of program activities. We also found an increase in PA support, as reported by the preadolescent daughters. Although preliminary, findings suggest that the educational and skill building activities in the program may have influenced the attitudes and PA of preadolescents. One interesting finding was that the preadolescents' positive perceptions of PA decreased from baseline to postintervention. One possible explanation of this is that once people begin engaging in PA, they realize how difficult it can be to maintain. The preadolescents may have had more positive perceptions of PA prior to attempting to increase their level of PA.

The influence of the program on the mothers was also notable. Mothers reported changes in their behavior that were associated with positive attitudes and behaviors of their daughters relating to PA. We found increases in mothers' monitoring and policies promoting PA, and positive parenting. The added value of including parents, in this case mothers, in intervention strategies is that parents themselves continue to serve as agents to behavior change, thereby increasing the probability that changes to preadolescents' behavior will be sustained. The intervention provided some guidance and skills through role playing in an area where parents thought they did not have role models from whom to learn parenting and communication skills, as many mothers noted that they were raised by parents who had more authoritarian parenting styles. Mothers also stated that they benefited from learning about parenting strategies to discourage unhealthy behaviors.

Complementing the quantitative findings were the postintervention focus groups with mothers and daughters, which provided insight into the preliminary impact, feasibility, and acceptability of the program. Participants explained that the setting and connection to faith and religion were beneficial in that the program facilitated parent-child

communication about the relationship between faith and health. Moreover, the mothers and daughters valued the involvement of the priest during the prayers and graduation ceremony.

According to both mothers and daughters, the program facilitated mutual communication. Improving family communication is critical because studies suggest that it is associated with preadolescents' PA. In a longitudinal study, Ornelas et al[48] examined the causal effects of family factors on the PA of a nationally represented sample of preadolescents aged 7 to 12 years. Their findings suggest that family cohesion and parental communication positively predicted the moderate-to-vigorous physical activity of youth 1 year later. On the basis of these findings, it is possible to influence PA by capitalizing on the synergistic effects of intervening on mother-daughter pairs. This strategy may be particularly effective among collectivistic cultural groups such as Latinos.

There were other aspects and strengths that contributed to the success of the program. Participants made direct connections between PA and health. For mothers, the prevention and alleviation of depressive symptoms and having a channel for removing oneself from stressful situations (eg, going to the park for a walk) were identified as benefits of PA. Both mothers and daughters acknowledged that the intervention improved psychosocial/mental health by increasing their ability to cope with emotions and stress. Furthermore, daughters made links to weight control, cardiovascular health, and general health with PA.

This pilot study is not without limitations. Sample size was small, limiting power for conducting significance tests. Thus, we are only able to assess preliminary trends and unable to determine the extent of the intervention effect on the measures. Moreover, the current study did not have a control condition, which increases the threat to internal validity. In other words, maturation, testing, and history threats may have influenced the results. Another limitation is the assessment of physical activity and TV-watching measures. Because these measures have not been validated with other objective measures, their validity is not known. Consistent with the limitations inherent in self-report measures, participants may have been more likely to overreport PA and underreport hours watching TV. Objective measures of PA would have likely provided us with a more accurate view of PA as well as the different intensity levels. The study augments previous research by examining the impact of a church-based family-level intervention on the PA of Latina preadolescents. Applying a culturally sensitive approach and providing opportunities for skill building for mothers to promote PA with their children were strengths. Also, involving church leaders for input prior to program implementation as well as to help lead the prayers and deliver the graduation certificates was essential to the success of the program. Per parents' suggestions during the follow-up focus groups [data not shown], future programs targeting Latina preadolescents' PA may want to incorporate additional sessions on healthy eating, parenting skills, and family communication. Research shows that PA interventions targeting youth that are at least 12 weeks in duration are more effective in impacting youth's PA compared with those of shorter duration.[49] Given more resources, future projects should consider developing programs at least 12 weeks in length. Moreover, future mother-daughter interventions aimed to increase preadolescents' PA may want to also engage mothers in the PA sessions to increase mothers' PA skills and instill PA habits. As a result, the mothers may become PA role models to their daughters. Findings from this study suggest that many of the strategies implemented in the mother-daughter intervention are acceptable, feasible, and ultimately, may lead to short- and long-term physical and emotional improvements for Latina preadolescents and their families.

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