

# Effects of a *Promotor*-Based Intervention to Promote Physical Activity: *Familias Sanas y Activas*

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Latinos are the largest and fastest growing minority group in the United States<sup>1</sup> and are among the most overweight.<sup>2</sup> As in other populations, obesity contributes to several of the leading causes of illness and death, including heart disease, cancer, stroke, and diabetes.<sup>3,4</sup>

Health disparities among Latinos need to be addressed. Physical activity (PA) is one method demonstrated to benefit health and improve quality of life.<sup>5,6</sup> Engaging in moderate to vigorous physical activity (MVPA) is also directly related to reducing one's risk for obesity.<sup>7</sup> The benefits of 60 minutes per week of moderate-intensity PA on risk of cardiovascular disease and diabetes are comparable to the benefits associated with vigorous-intensity PA.<sup>6</sup> Despite its evident benefits, rates of MVPA are markedly low among Latinos.<sup>8,9</sup> In previous research, few women in the target communities were found to meet recommendations for vigorous PA (30%), moderate PA (8.6%), or walking (46.4%).<sup>10</sup> Only 25% of women in another study conducted in these same communities met PA recommendations.<sup>11</sup>

## PHYSICAL ACTIVITY INTERVENTION TARGETING LATINOS

Several studies have sought to promote PA among Latinos including the *Pausa Para la Salud* worksite intervention,<sup>12</sup> the *Camina por Salud* walking program,<sup>13,14</sup> the *Un Corazón Saludable* aerobics program,<sup>15</sup> and a mail versus mail-plus-phone intervention.<sup>16</sup> These studies achieved reductions in waist circumference in both men and women,<sup>12</sup> decreases in body mass index (BMI; defined as weight in kilograms divided by the square of height in meters) among men but not women,<sup>12</sup> decreases in BMI among women,<sup>14</sup> decreases in the proportion of program completers who were obese,<sup>15</sup> decreases in abdominal obesity and waist-to-hip ratio,<sup>15</sup> and increases in energy expenditure.<sup>16</sup> Despite these positive findings, not all PA interventions for Latinos have achieved significant results.<sup>17</sup>

**Objectives.** This within-participants, single time-series study tested a train-the-trainer, *promotor*-based physical activity (PA) intervention to improve fitness and health indicators.

**Methods.** Thirty unpaid *promotores* were trained to promote PA through free exercise classes. Measurements of 337 female community participants at baseline, 6 months, and 12 months assessed changes in health indicators, including systolic and diastolic blood pressure, waist circumference, body mass index (defined as weight in kilograms divided by the square of height in meters), aerobic fitness, and hamstring flexibility, as well as self-reported health indicators (PA, depression) and psychosocial factors (barriers, self-efficacy, and social support—all specific to PA).

**Results.** Mixed effects models showed intervention participation improved systolic blood pressure ( $P \leq .001$ ), waist circumference ( $P \leq .001$ ), fitness ( $P \leq .001$ ), and hamstring flexibility ( $P \leq .001$ ). We also noted improvements in use of community resources ( $P \leq .05$ ), depressed mood and anhedonia ( $P \leq .01$ ), perceived barriers to be physically active ( $P \leq .05$ ), and community support for PA ( $P \leq .001$ ). Self-efficacy decreased ( $P \leq .05$ ), and participation dose (i.e., exposure), as measured by attendance at exercise classes, was not associated with observed changes.

**Conclusions.** *Promotores* can promote PA in their community and achieve meaningful changes in the residents' health. (*Am J Public Health.* 2011;101:2261–2268. doi:10.2105/AJPH.2011.300273)

*Promotora*-delivered interventions have achieved meaningful changes in PA. (The spelling of Spanish nouns often varies by gender. *Promotor* and *promotores* are the singular and plural representations of either the masculine or combined forms of this noun; *promotora* refers specifically to women.) Balcazar et al.'s *Su Corazón, Su Vida* intervention involved *promotora*-mediated classes (7 or 8 classes delivered over a 3-month period) that included PA and resulted in an increase in the percentage of families who reported being physically active.<sup>18</sup> Staten et al. tested the efficacy of *Pasos Adelante*, a 12-week cardiovascular risk reduction program, on community participants' self-reported MVPA and found increases in moderate and vigorous walking.<sup>19</sup> A *promotora*-delivered program to improve diabetes control yielded increases in respondents' reported participation in PA with their families.<sup>20</sup> Finally, a 3-class *promotora*-based intervention targeting diet, smoking, and PA resulted in increased self-reported MVPA from baseline to

1 month.<sup>21</sup> *Promotores* are effective change agents.<sup>22</sup> Nevertheless, there is a gap in the literature on the extent to which they can be trained to deliver PA interventions and increase important health indicators such as aerobic fitness. To address this gap we hypothesized that a train-the-trainer intervention would be successful in enabling *promotores* to promote program participation and improve health outcomes in a group of community residents.

## METHODS

*Familias Sanas y Activas* is a train-the-trainer intervention and the core research project of the San Diego Prevention Research Center (SDPRC), a Centers for Disease Control and Prevention–funded academic–community partnership among San Diego State University; University of California, San Diego; San Ysidro Health Center; and the SDPRC's Community Engagement Committee. The Community Engagement

Committee is represented by 2 city recreation departments, a school district, a school, a community health center, a county office of health and human services, 2 key social service agencies, and a public housing service center.

The *Familias Sanas y Activas* study used a within-participants, single time-series design with measures conducted at baseline, 6 months, and 12 months. Study activities occurred between spring 2007 and fall 2009.

The partner communities are located in South San Diego County, California, situated along the US–Mexico border. The South region encompasses approximately 300 000 residents, 58% of whom are Latinos.<sup>23</sup> The median age is 29 years with a median household income of \$37 948; 67% of the population completed high school and 13% have a Bachelor's degree or higher. These data are substantially different from overall 2005 US population statistics, which indicated that 13% were Latino or Hispanic, 74% were aged between 18 and 65 years, and 80% had at least completed high school.<sup>24</sup>

## Intervention

*Promotor(a) selection and training.* Over a 4-month period, Community Engagement Committee members engaged in discussions about what PA promotion strategies to use, which partners to include to support the effort, and how best to evaluate activities. We developed a logic model to guide intervention and evaluation activities. Among decisions made during these discussions was the selection of a community health center, a multiservice agency, a social service agency of a large public housing complex, and a city department of recreation to participate as performance sites because of the concordance between their and the SDPRC's organizational missions. We considered program sustainability when choosing to evaluate an unpaid *promotor(a)* model versus a paid model. The group selected a within-participants time-series study design because of the communities' need for the program as evidenced by the obesity prevalence rates and the lack of PA observed in the communities. Because of the emphasis on fitness and obesity, blood pressure, waist circumference, and aerobic fitness were among the selected outcomes. The measures were considered a free health appraisal and thus an evaluation incentive was not offered.

Each partner agency signed an agreement outlining agency and SDPRC responsibilities. Agencies were responsible for selecting 2 trainers and providing facilities for trainings and graduation ceremonies. Trainers were selected based on interest in promoting PA, availability to implement activities, and intention to remain in the area for at least 12 months. The SDPRC was responsible for training trainers and assisting in the identification, recruitment, training, and support of *promotores*. The community health center selected health educators involved in a diabetes prevention program. The multiservice agency selected the manager of its small gym and a staff member responsible for youth programs. The public housing complex's social service agency relied on 2 residents. The city recreation department selected 2 volunteers—1 who was active in a community health initiative and the other with interest and experience in PA promotion. All trainers were women aged between 19 and 45 years (median=36).

The SDPRC staff, trainers, and Community Engagement Committee members identified potential *promotores* via word of mouth, presentations, and flyers distributed at community events, churches, school groups, and tenant organizations. *Promotores* were invited to participate in an interview and then screened for eligibility: aged 18 years or older, bilingual Spanish and English or monolingual Spanish speakers, at least a 6th-grade reading level, physically able to lead PA groups as determined by the Physical Activity Readiness Questionnaire (PAR-Q),<sup>25</sup> interest in promoting PA, and resident of target communities with intent to remain in study area for 12 months. The PAR-Q is a questionnaire used to screen for risk factors before engaging in physical activity. If a *promotor* responded “yes” to any items (e.g., Has a doctor ever said your blood pressure was too high?), then the *promotor* was required to obtain doctor's permission to participate.

Selected *promotores* completed an 8-session training that included content on what it means to be a *promotor*, how to effect behavior change, and how to organize and lead PA groups. The *promotores'* curriculum was modeled after the trainer curriculum in terms of literacy level (6th grade), session length (2 hours per session), and structure (didactic materials, role plays, and case studies).

Following the training, the *promotores* met with an SDPRC PA specialist who helped design the PA programs, including selecting types of PA to promote, how often to conduct classes, and class locations. Because the target population was relatively sedentary, *promotores* created exercise classes of moderate intensity. *Promotores* maintained attendance sheets to track community participant engagement and submitted them to the coordinator at weekly or biweekly meetings.

*Promotores* received professional development incentives consistent with the intervention's capacity-building objective, including a certificate for training completion, a graduation ceremony, a Red Cross First Aid and CPR course and certificate, \$75 annually to purchase PA equipment, and \$500 annually to obtain additional professional training.

*Promotor and community participant materials.* A PA toolkit was provided to all *promotores* and community participants. It contained a pedometer, water bottle, stretch band, and bilingual PA promotional materials, including a community resource guide of free and low-cost PA resources (with a map of resource locations), 1-mile walking path maps for 3 community parks, and pictorial instructions of basic yoga poses, home-based exercises, stretch band exercises, and a pedometer use guide. All materials were written at a 6th-grade literacy level and included photos of Latino models performing exercises. To serve as a cue to action, a third type of map was provided that depicted PA locations in the target community (with a special emphasis on parks and recreation centers), well-recognized landmarks, and a calendar created by a local Chicano artist (Figure 1). *Promotores* received their toolkits at the beginning of training and community participants received theirs after completing baseline measures.

## Community Participant Recruitment and Evaluation Procedures

Community participants were recruited via word of mouth, presentations, radio public service announcements, and flyers. Interested individuals were screened using the PAR-Q<sup>25</sup> by trained, bilingual research assistants (RAs) at regularly scheduled measurement events. If all responses were “no,” RAs obtained informed consent. If any of the 10 responses was “yes,” the



**FIGURE 1—Calendar and map of community depicting parks and recreation departments and other activity-promoting locations.**

RAs issued a Physical Activity Readiness Medical Examination (PARmed-X) form with instructions to seek medical approval within 1 month to participate in the program. After receiving the form, RAs obtained informed consent and completed baseline measures. The measurement protocol was readministered at 6 and 12 months.

**Measured outcomes.** Research assistants assessed sitting resting blood pressure by using standard protocols with an Omron (Bannockburn, IL) automatic blood pressure monitor with ComFit cuff, and waist circumference in centimeters with a nonstretch measuring tape.<sup>26</sup> The RAs obtained 2 measurements of

waist circumference and repeated until 2 consecutive measurements differed by less than 2.0 centimeters from each other and then averaged them. To calculate BMI, the RAs obtained measurements of weight and height (kg and m), each taken a minimum of 3 times to obtain measures that did not differ by more than 0.5 kilogram for weight and by more than 1.0 centimeter for height.<sup>26</sup> Participants performed the 6-minute walk test, a valid method to measure aerobic fitness,<sup>27</sup> indoors in a large open warehouse (to minimize the effects of weather conditions) and according to American Thoracic Society procedures.<sup>28</sup> The RAs

instructed community participants to walk, without running, as far as possible in 6 minutes around a set of cones, and then recorded distance walked in meters. Participants completed the sit-and-reach test, a measure of leg or hamstring flexibility, by using a standardized protocol by having community participants remove their shoes and then sit on the floor with their shoulders, heads, and buttocks against a wall and legs straight in front. A sit-and-reach box was placed against the soles of their feet with the zero end toward the individual. Community participants maintained head and shoulder contact with the wall while holding their arms straight in front of their bodies. They were instructed to bend at their waists and reach forward as far as possible, exhaling as they did so. The best of 3 trials, recorded in centimeters, determined the final score.

**Self-reported health behaviors and indicators.** The 16-item Global Physical Activity Questionnaire (GPAQ),<sup>29</sup> made available in both English and Spanish, measured community participants' work or household, leisure-time, and transportation PA. Days per week and total time spent in work or household, leisure time, and transportation PA yielded estimates of metabolic equivalent-minutes (MET-minutes). We obtained MET-minutes by comparing a person's predicted resting metabolic rate to the metabolic equivalent for each reported activity, and calculated based on the energy equivalent for each activity and its corresponding duration in minutes.<sup>30</sup> We calculated MET-minutes of leisure PA, a continuous variable. The RAs asked community participants the number of days they had used parks, trails, or other recreational facilities for PA during the past month. This study-developed question served as an indicator of how well the toolkit materials may have prompted them to visit these locations. Consistent with the Stages of Change component of the Transtheoretical Model,<sup>31</sup> a 14-item yes-or-no scale assessed behavioral dimensions associated with readiness to engage in PA (Table 1). A higher sum score indicated greater readiness to engage in PA. The Patient Health Questionnaire-2 measured the frequency of depressed mood and anhedonia in the past 2 weeks ( $\alpha=0.85$ ).<sup>32,33</sup> Response options ranged from 1=not at all to 4=nearly every day. We computed a sum score with

**TABLE 1—Frequencies for Endorsements of Readiness to Increase Physical Activity Items Among Female Community Participants: South San Diego County, CA, Spring 2007 to Fall 2009**

	Baseline, % (n = 337)	6 Months, % (n = 174)	12 Months, % (n = 200)
<b>Purchasing items</b>			
Bought a pair of shoes for a physical activity (sneakers to walk, dance shoes to dance)	39	41	35
Bought any exercise equipment, including weights, mats, bands, pedometer, machines, or bicycle	22	35	23
Bought an exercise videotape or DVD	18	24	19
<b>Group support</b>			
Talked to a someone (friend, family member, coworker) about exercising with you	74	76	76
Started taking a class that was physically active	19	28	21
Joined a walking or other exercise group	21	32	21
Attended free or low-cost meetings (for example, Weight Watchers, church groups, hospital programs) that supported you being physically active	10	21	14
Joined a community group that was active (dancing, karate)	7	15	14
Joined a sports team	1	1	3
<b>Community resource use</b>			
Visited an outdoor place (park, mountains, desert, beach) and was physically active	56	67	68
Visited a gym or other indoor place and was physically active	20	27	25
Joined a gym	10	10	6
<b>Daily activities</b>			
Found ways to walk more during your daily activities (e.g., take the stairs instead of the elevator, park your car farther away)	64	68	76
Looked for and read information about how to become more physically active	54	53	51

higher sum scores indicating more frequent symptoms.

**Self-reported psychosocial variables.** The RAs asked community participants about barriers to being physically active by using a modified version of the GRAD (Graduate Ready for Activity Daily) survey.<sup>34</sup> The 11-item barriers scale assessed both motivational and structural barriers with response options ranging from 1=strongly disagree to 5=strongly agree. Higher mean scores indicated greater perceived barriers to PA ( $\alpha=0.79$ ). Self-efficacy for being physically active involved use of the 3-item San Diego Health and Exercise Study<sup>35</sup> scale. Higher mean scores indicated more confidence in ability to do moderate activity ( $\alpha=0.82$ ). The RAs asked about family and friend support for exercise with 6 questions selected from a 26-item scale that measured various types of social support (e.g., emotional, informational, instrumental).<sup>35</sup> To minimize respondent burden, we selected only 6 items that best reflected instrumental support for physical activity (e.g., During the past month, did your family do physical activity with you?) and response options ranged from 1=never to 5=very often. Higher mean scores indicated more frequent social

support ( $\alpha=0.84$ ). We measured partner support for exercise using 2 of the 3 social support questions worded specifically for partners plus 3 questions assessing other forms of instrumental partner support: help plan activities around your PA, take over chores so you had more time to be physically active, and offer to mind the children so you could be more physically active. Items were based on study findings of the mediating variables of exercise behaviors among women with young children<sup>36</sup> and qualitative research conducted by members of the study team. Higher mean scores indicated greater partner support ( $\alpha=0.85$ ). We assessed community support for exercise using 4 statements from the Sumter County Active Lifestyles study.<sup>37</sup> Higher mean scores indicated more community support ( $\alpha=0.75$ ).

**Demographics.** The RAs asked community participants demographic questions based on the 2005 Behavioral Risk Factor Surveillance System survey pertaining to age, gender, nativity, marital status, number of children living in the home, education, employment status, and income. We recoded place of birth as 1=foreign born and 0=US born. Marital status was collapsed into 1=married (married or living

as married) and 0=not married (divorced, widowed, separated, or never been married) as in previous research.<sup>9</sup> We recoded education, employment, and income as 1=completed high school or more versus 0=less than high school, 1=employed for wages (including self-employed) versus 0=unemployed (including homemaker, student, retired, unable to work) and 1= $\geq$ \$24 000 annually versus 0= $<$ \$24 000 annually.

### Program Participation

We entered information from *promotores'* attendance sheets into a spreadsheet to track the number of classes each community participant attended between baseline and 6 months and between 6 and 12 months as an indicator of intervention dose.

### Data Analyses

We performed descriptive statistics on all variables to ensure they met statistical assumptions. To analyze the repeated measures of each outcome, we used a mixed effects model with time and dose of exercise classes as the independent variables for assessing time trends and a dose-response relationship. We analyzed

all available data points. Thus, although a participant may have missing data at the 6- or 12-month follow-up, we still included data available at nonmissing time points in the analyses. Mixed effects models have a built-in tolerance for data that are missing at random. To conduct the analyses, we used PROC MIXED in SAS 9.2 (SAS Institute, Cary, NC).

## RESULTS

As outlined in Figure 2, we screened 530 community members for inclusion, 97 did not return their PARmed-X forms, and 3 were ineligible for health reasons. Of those who consented to participate, 22 (5%) subsequently refused to participate and 21 (5%) never completed the evaluation protocol. The final sample of 387 adults was further reduced to 337; we excluded women aged 60 years and older ( $n=34$ ) because of differences in evaluation procedures used with seniors and we excluded men ( $n=16$ ) because of limited generalizability of such a small sample. Retention of community participants was challenging in part because of the lack of evaluation incentives. At 6 and 12 months after baseline, 178 (53%) and 207 (61%) community participants, respectively, completed the evaluation protocol. At 6 months, those remaining in the study were more likely to be foreign born ( $P<.05$ ) and unemployed ( $P\leq.05$ ) than were those who dropped out. At 12 months, those remaining in the study were older ( $P\leq.05$ ) than were those who dropped out. Outcome measures at baseline between

those who were retained and those who dropped out were not significantly different (see Table 2 for demographic characteristics of final sample).

### Promotor Intervention Delivery

Thirty adults, of whom 29 were female, volunteered to serve as *Familias Sanas y Activas promotores* and conduct group exercise classes. Agencies provided free space for classes, which were held at a public housing complex, an elementary school, a federally supported community health center, a storefront health promotion center, recreation centers and adjacent parks of 2 cities, and a YMCA.

Exercise classes were held on weekdays. To accommodate as many community participants as possible, some started as early as 8:00 AM and others were held in the evening. *Promotores* were encouraged to hold classes at least 2 days a week, and some opted to have classes on 3 or 4 days. *Promotores* led walking groups, taught conditioning and strength-building exercises, directed circuit training, and conducted dance, aerobics, multirhythmic, and other group classes (e.g., Zumba). Most classes were designed to be moderate intensity, because community residents were relatively sedentary.<sup>10,11</sup> However some (e.g., Zumba) were of moderate to vigorous intensity. Each exercise class lasted approximately 1 hour and started with a 5-minute warm-up and ended with a 5-minute cool-down. Consistent with seasonal variations, the number of PA classes held during any week ranged from 3 between December

31 and January 4 to a high of 27 between March 17 and March 21.

### Community Participant Self-Reported and Measured Changes

We noted increased use of parks and recreation facilities for PA ( $P\leq.05$ ) and reductions in depressed mood and anhedonia ( $P\leq.05$ ) and in perceived barriers for being physically active ( $P\leq.01$ ; Table 3). Perceived community support for PA increased ( $P\leq.001$ ), and self-efficacy for being physically active decreased ( $P<.05$ ). Table 1 shows that community participants purchased more equipment and sought more community resources over time, and income did not explain this change although baseline frequencies were correlated with income ( $r=0.19$ ;  $P\leq.01$ ). We did not observe other self-reported changes.

We observed decreases in systolic blood pressure ( $P\leq.001$ ) and waist circumference ( $P<.001$ ), while aerobic fitness ( $P\leq.001$ ) and hamstring flexibility ( $P\leq.001$ ) both increased. No changes were observed in weight, BMI, and diastolic blood pressure.

### Intervention Dose

Intervention dose was determined by the number of times a community participant signed into any of the *promotores'* exercise classes over the course of their 12-month tracked involvement. Attendance underrepresented dose because staff logs indicated that attendance sheets were not collected for all weeks that every *promotor* delivered a class, and dose data were missing from 30% ( $n=101$ ) of community participants when they were examined at 6 and 12 months after baseline. Mean number of classes attended between baseline and 6 months was 8.3 ( $SD=12.9$ ) and between 6 and 12 months was 7.8 ( $SD=14.4$ ), resulting in a total mean attendance of 16.1 ( $SD=23.6$ ). No significant associations were observed between dose and observed changes.

## DISCUSSION

As hypothesized, a train-the-trainer intervention involving unpaid *promotores* was shown to improve the systolic blood pressure, waist circumference, aerobic fitness, hamstring

**TABLE 2—Demographic and Sociocultural Characteristics of Female Community Participants (n=337): South San Diego County, CA, Spring 2007 to Fall 2009**

Characteristics	Mean $\pm$ SD or No. (%)
Age, y	38.7 $\pm$ 9.1
Median household size	4
Married or living as married	244 (73)
Employed	135 (40)
Household income $\geq$ \$24 000/y <sup>a</sup>	140 (48)
Completed $\geq$ high-school education	189 (56)
Foreign born	261 (78)
Of the foreign born, proportion born in Mexico	253 (97)

<sup>a</sup>Data missing from 46 respondents who chose not to provide income data.

**TABLE 3—Mixed Effects Model of Intervention Effects on Measured and Self-Reported Outcomes Among Female Community Participants: South San Diego County, CA, Spring 2007 to Fall 2009**

Outcomes	Baseline		6 Months		12 Months		P
	No.	b (SE)	No.	b (SE)	No.	b (SE)	
<b>Measured</b>							
Systolic blood pressure, mm Hg	334	123.85 (15.02)	161	121.74 (13.87)	179	118.90 (13.60)	≤.001
Diastolic blood pressure, mm Hg	334	75.13 (10.03)	161	73.45 (9.46)	179	72.73 (9.05)	NS
Waist circumference, cm	334	104.43 (15.26)	160	104.07 (14.03)	177	102.03 (12.79)	≤.001
Weight, kg	335	75.71 (17.10)	161	75.23 (16.67)	177	74.62 (14.77)	NS
Body mass index, kg/m <sup>2</sup>	335	30.35 (6.58)	161	30.26 (6.19)	177	30.08 (5.49)	NS
6-min walk test, m	240	544.53 (64.48)	109	570.85 (60.97)	128	563.57 (60.73)	≤.001
Sit and reach test, cm	316	27.11 (7.59)	134	28.03 (7.29)	135	28.14 (7.53)	≤.001
<b>Self-report</b>							
MET minutes of LTPA	336	714.46 (1117)	178	843.48 (1055)	205	795.10 (1066)	NS
Days used parks and recreation facilities	335	6.7 (6.8)	174	6.4 (6.4)	201	7.3 (7.0)	≤.05
Readiness to engage in physical activity	336	4.13 (2.42)	174	4.98 (2.90)	200	4.47 (2.39)	<.05
Depression	335	3.37 (1.33)	173	3.20 (1.11)	200	3.13 (1.16)	≤.01
Barriers to physical activity	336	2.55 (0.73)	174	2.41 (0.79)	200	2.36 (0.78)	≤.01
Self-efficacy for physical activity	336	4.31 (0.78)	174	4.13 (0.83)	201	4.16 (0.89)	≤.05
Friend and family support for physical activity	336	2.68 (1.01)	174	2.77 (1.04)	201	2.60 (0.93)	NS
Partner support for physical activity	256	2.61 (0.89)	135	2.75 (0.91)	154	2.57 (0.98)	NS
Community support for physical activity	336	2.65 (0.75)	174	2.96 (0.75)	201	2.90 (0.73)	≤.001

Notes. LTPA = leisure-time physical activity; MET = metabolic equivalent; NS = not significant. Significance set at  $P \leq .05$ .

flexibility, and depressive symptoms of community residents. For example, the mean systolic blood pressure went from prehypertensive to normal. Improvements in fitness paralleled those of breast cancer patients in a Pilates intervention (26 m<sup>38</sup>), but were not as strong as those for obese adults in an aqua-jogging program (41 m<sup>39</sup>). This is the first study to our knowledge to report on changes in aerobic fitness among Latinos from a community trial. We observed self-reported increases in readiness to engage in PA, use of parks and recreation facilities for PA, and community support for PA. The latter 2 findings suggest that this type of intervention resulted in generalization of behavior change to other contexts and may change community norms related to PA, an important goal for sustaining behavioral changes.<sup>40</sup> On the other hand, self-efficacy decreased. This finding is consistent with previous research demonstrating a negative<sup>41</sup> or nonexistent<sup>42</sup> association between self-efficacy and PA among Latinos and a general consensus that self-efficacy may not function in a similar manner among Latinos.<sup>43</sup>

This study had several limitations related to the study design, measurement of dose, no measure of exercise class intensity, and retention rate. A within-participants, single time-series design fails to control for alternative explanations, including self-report bias. The decision to use this study design was made in collaboration with community partners and was driven in part by limited activity-promoting resources in the community and a funding mandate that emphasized community demonstration and translation more than a randomized controlled study. Concerns about this limitation are lessened by improvements in objectively measured outcomes not subject to self-report bias. Our measure of intervention dose was limited by lack of data from close to a third of community participants and knowledge that attendance sheets were not turned in for all classes delivered. We did not measure exercise class intensity, an important variable to consider when one is designing a group exercise program to improve fitness. Future studies should consider assessing class intensity consistent with methods used

in physical education classes such as System for Observing Fitness Instruction Time.<sup>44</sup> The low retention rate brings into question the study's validity, as selection bias may have functioned to retain community participants enjoying more success in the program. However, as indicated, we observed few differences between community participants who remained in the study versus those who dropped out.

Funding for this effort was limited, restricting the ability to program for maintenance of behavior change. However, the project was recently re-funded for an additional 5 years beginning in 2009. As of September 2010, 12 *promotoras* remained involved in the program and the SDPRC team was designing the next iteration of this program with greater attention paid to (1) group cohesion to increase intervention dose and retention, and to build a potentially sustainable social network that supports PA and (2) methods for tracking intervention dose. Funds are now going to 3 community agencies to support the employment of 1 individual to run the program through their

agencies, which will hopefully optimize the chance for institutionalization of the program or its key elements. Through such efforts at promoting PA, we hope to contribute to a model to reduce health disparities observed among community residents living on the US–Mexico border. ■

### About the Authors

The academic and community partners of the San Diego Prevention Research Center have chosen to author this article as a collaborative effort because of everyone's instrumental role in this process.

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### Contributors

This study was conducted as a part of an academic–community partnership known as the San Diego Prevention Research Center. All decisions were made jointly with members of the investigative team and the community engagement committee, whose names are listed in the "Acknowledgements" section. All individuals named participated in meetings to decide on the structure of the intervention. In addition, all individuals named conceptualized the measurement protocol and in some cases, assisted with the implementation of the protocol. G. X. Ayala, M. Ji, and M. Molina took primary responsibility for preparing the analyses, and G. X. Ayala took primary responsibility for preparing a first draft of the article. All individuals named provided comments to several drafts of the article and approved the final version.

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### Human Participant Protection

All research activities were approved by the institutional review board at San Diego State University and the University of California at San Diego.

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