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Social Influences on Self-Reported Physical Activity in Overweight Latino Children

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Abstract

Psychosocial variables influence physical activity for different age groups, sex, and ethnic groups. However, little is known about their influence on physical activity in preadolescent Latino children. The authors examined how a) confidence in one's ability to be physically active (self-efficacy); b) ideas about the consequences of being physically active (beliefs), and c) the influences of family and friends on physical activity (social influences) effect physical activity levels in overweight (body mass index ≥85%) Latino preadolescent children. One hundred and fourteen preadolescents participated in a larger intervention designed to improve healthy lifestyles for Latino families. The authors report baseline data collected at a community-based primary care clinic. Multivariate regression analyses showed that only social influences significantly predicted ($P < .01$) the metabolic equivalent adjusted self-reported baseline physical activity. Prevention and intervention strategies that augment social influences on physical activity are likely to result in more physical activity and improved health in these children.

Keywords

social influences; body mass index; obesity; Hispanic Americans

Obesity, now an epidemic in US children, disproportionately affects Latino children as prevalence rates are higher in Latino children than in their African American or Caucasian counterparts.[1,2] However, despite this increased disease burden, few studies have described overweight Latino children.

Increased energy intake and decreased energy expenditure are primary contributors to obesity. Because Latino children of all ages have more inactivity and less moderate and vigorous activity than other ethnic groups,[3] increasing physical activity is likely to be a particularly effective target for obesity interventions in this population. Psychosocial variables, including a) confidence in one's ability to be physically active (self-efficacy), b)

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ideas about the consequences of being physically active (beliefs), and c) influences of family and friends on physical activity (social influences), strongly influence an individual's amount of physical activity.[3-5] Furthermore, studies have shown that the perceived benefits of exercise contribute significantly to exercise intent[4] and that intention to be physically active, self-efficacy for physical activity, and social influences are significantly associated with actual physical activity.[5]

Studies examining the psychosocial determinants of physical activity have primarily described adults[6-8] and adolescents,[9-14] fewer have focused on younger children, such as preadolescents. Studies of Latino adults have shown the importance of social and family support.[6,7] In addition, studies of adolescents have shown the association between self-efficacy and positive beliefs with directly measured physical activity.[5] However, the role that these psychosocial variables play in determining the level of physical activity in Latino preadolescent children, particularly, in those who are obese, remains unknown.

The strong influence of family in the Latino community suggests that intervening on self-efficacy, beliefs, and social influences, all of which can be shaped by family influences and parenting, may have a significant and synergistic effect on reducing risk behaviors. This is likely to be true especially in the preadolescent period, which constitutes a period of significant physical, cognitive, and psychosocial development.[15] Therefore, the preadolescent period offers a unique opportunity to affect health behaviors within the family prior to the child becoming more peer focused. To better describe this population, the objective of this study was to examine how a) confidence in one's ability to be physically active (self-efficacy); b) ideas about the consequences of being physically active (beliefs), and c) influences of family and friends on physical activity (social influences) effect physical activity levels in overweight (body mass index [BMI] ≥ 85%) Latino preadolescents.

Methods

Participants

Prior to initiation, the Institutional Review Board of Wake Forest University Health Sciences reviewed and approved the study. Latino children (defined as having a parent born in Latin America) 8 to 12 years of age with a BMI ≥ 85 percentile for age and sex were identified from a variety of sources, including a primary care clinic, radio advertising, and local churches in Forsyth County, North Carolina. Some participants also referred other families. Eligibility criteria required that participants had to read at least at a third grade level. Informed consent or assent for adults and children was provided verbally, and study instruments were completed in the preferred language. Each child needed to have at least 1 adult family member (>18 years) participate, as family involvement was a goal of the program. Some adult family members participated with multiple children.

Of the 247 children identified, 159 agreed to participate; however, not all of these actually enrolled at the baseline visit. Of the 88 families that did not agree to participate, 20 declined due to personal inconveniences or beliefs that the child was healthy and the program seemed unnecessary, 21 did not qualify based on eligibility criteria, and 47 did not have a valid

phone number or failed to respond to the study invitation. Data were analyzed for the 114 children who met eligibility criteria and attended the baseline visit.

Data Collection

Data were derived from the initial visits of a broader intervention promoting healthy lifestyles in obese (BMI ≥95%) or overweight (BMI ≥85%, <95%) Latino children. Data were collected at a community-based primary care clinic. Demographic information was collected from both the child and the adult family member, including the following information: adult's relationship to the child, parent's highest level of education completed, parent's country of origin, language spoken most at home, and language spoken most with friends. Weight and height were measured before the completion of the survey instruments. Children and parents completed the surveys separately from one another and in the language of their choice. Free transportation and bilingual staff were available.

Instruments

Survey items were written at a third grade reading level and were translated and back translated through a professional translation company. Abbreviated versions of previously validated scales (Self-Efficacy, Beliefs, and Social Influences scales)[16] were developed with guidance from the scale developers and used to avoid survey fatigue. Participants chose between affirmative and negative responses, as opposed to the original 5-point Likert scales. This response score change was informed by cognitive interviewing with 15 Latino families who indicated that dichotomous choices were more understandable than 5-point scales. The psychometric properties of all modified scales were examined and met the standard internal consistency criteria for sound scale construction (alpha > .70).

Physical Activity Scale—Children began with a survey based on the Self-Administered Physical Activity Checklist (SAPAC)[17] for children, which assesses participation in 23 common physical activities on a typical day in the previous week. Each activity had a section for before school and after school where children chose either none, less than 10 minutes, or greater than 10 minutes. The standard metabolic equivalent (MET) provides an energy expenditure rate for each physical activity on the SAPAC and is a multiple of resting metabolic rate, thus reflecting the relative energy cost of each activity. The physical activity score was calculated by adding the before school and after school scores and then multiplying this combined activity score by each activity's MET.[17,18] Thus, the physical activity score describes the relative amount of each child's energy expenditure over all physical activities. The validity of the SAPAC has been established by a correlation with heart rate index (Pearson correlation = 0.57, $P < .0001$) and accelerometer score (Pearson correlation = 0.30, $P < .001$).[17]

Self-Efficacy Scale—The self-efficacy scale was based on a previously validated 17-item Self-Efficacy Scale (alpha = .54-.71, test-retest = .61-.82).[16] The original self-efficacy scale consists of 3 subscales: support seeking, barriers, and positive alternatives.[16] With guidance from the survey developers, we selected a subset of 6 items that tapped into the support seeking factor and positive alternative factor of the original scale, producing a scale ranging from 0 to 6, where higher values indicated increased self-efficacy. Reliability in our sample

was high (alpha = .99). Participants answered a series of yes/no questions, such as: I think I have the skills I need to be physically active and I think I can ask my parents or other adults to do physically active things with me.

Beliefs Scale—The beliefs scale was adapted from a previously validated 16-item Beliefs Scale (alpha = .58-.75, test-retest = .51-.69) that in its entirety consists of 2 subscales: physical outcomes and social outcomes.[16] With guidance from the survey developers, a subset of items that tapped into the physical outcomes factor and social outcomes factors of the original scale were selected, producing a scale that ranged from 0 to 12, where higher scores indicated increased positive influence of activity in daily life. Reliability in our sample was high (alpha = .98). Participants answered 12 yes/no items, 4 of which were negatively framed and later reverse coded, such as “If I were to be physically active most days, it would make me get hurt.” The remaining items were positively framed, so a “yes” answer indicated positive health belief, such as “If I were physically active most days, it would get or keep me in shape.”

Social Influences Scale—The social influences scale was modified from a previously validated 8-item single-factor scale (alpha = .75, test-retest = .78).[16] With guidance from the scale developers, a subset of 6 items was selected producing a scale that ranged from 0 to 6, with higher numbers indicating increased social support for being physically active. Reliability in our sample was high (alpha = .97). Social influences on physical activity were measured using 6 yes/no questions, which inquired about both family and peer encouragement or support of a child's physical activity, for example, “Someone in my family has offered to be physically active with me in the past 2 weeks” and “My friends think I should be physically active.”

Statistical Analysis

Descriptive statistics were used to present the general information about the distributions of the variables of interest in this study. With the total physical activity score as the dependent variable, multiple regression was used to analyze the relationship between physical activity and the various psychosocial attributes of the children. The independent variables of interest were the self-efficacy, beliefs, and social influences scales. The analysis controlled for both sex and age. The sample included 11 two-sibling families and 1 three-sibling family. To account for potential correlation between siblings within the same family, a mixed effects model with random effects for family was used for data analysis. The analysis was performed using SAS v9.0 (SAS Institute Inc, Cary, North Carolina).

Results

Table 1 provides a description of the child participants. Participating adult family members were usually the mother (88%) or the father (9%). Most adults were from Mexico (73%) and spoke Spanish at home and with friends (95% and 99%). Forty-two percent (42%) of adult family members had less than an eighth grade education. Table 2 summarizes the scores for the independent and dependent variables.

A model was created to examine the associations of self-efficacy, beliefs, and social influences with MET-adjusted physical activity in the children in our sample, controlling for age and sex. We observed significant correlation between the self-efficacy and social influence variables ($r = .35$, $P < .001$) and the self-efficacy and beliefs variables ($r = .28$; $P < .001$). The model was tested with and without self-efficacy as an independent variable. The final model excludes self-efficacy as an independent variable due to multicollinearity between self-efficacy and social influences. Results were the same for both models, showing that only social influences significantly predicted ($P < .01$) MET-adjusted self-reported baseline physical activity in this sample. Self-efficacy, when included in the model, and beliefs about physical activity were not statistically significant. The regression estimates for the model, excluding self-efficacy, are given in Table 3.

Discussion

Social influences significantly predicted ($P = .0046$) MET-adjusted self-reported baseline physical activity in this sample of overweight Latino preadolescents: as positive social influences increased, self-reported physical activity also increased. Social influences, as measured in this study, included family or friends who believed that it was good to be physically active or offered or joined the child in physical activity. These results did not vary by sex or age.

This significant and positive correlation between social influences and physical activity is similar to what has been seen in adult and adolescent studies but which was previously unknown in Latino preadolescents. With this correlation now apparent in overweight Latino preadolescents, interventions can be tailored to include support and augmentation of these social influences to encourage physical activity.

The cultural context of Latino children lends itself to building and using social influences to change physical activity habits. Latino culture highly values the family and considers the family to be the most important social unit.[14,19-21] The Latino family or “familia” typically extends beyond the nuclear family, usually including extended family and close friends. With these social ties comes the moral responsibility to aid other members of the family experiencing financial problems, unemployment, poor health conditions, and other life issues.[21] Thus, the value of familia for the Latino community represents a significant opportunity to change poor health behaviors in this population.[22]

Obesity rates have rapidly increased over the past 3 decades for all Americans but have doubled for children. In 2004, over 12 and a half-million children and adolescents 2 to 19 years of age were overweight.[23,24] The health risks of overweight and obesity in childhood are well established and include the onset of type 2 diabetes, hypertension, hyperlipidemia, abnormal glucose tolerance, and psychosocial problems, such as weight prejudice.[25] Moreover, overweight children are significantly more likely to become overweight adults. To stem the tide of pediatric obesity, culturally meaningful programs will need to be developed. We suggest capitalizing on the core values of being a good parent and supporting family members in any effort to change poor health behaviors. To do this, we need to deliver the message to parents in the Latino community that children need physical activity to be

healthy and that encouraging and supporting regular daily activity is an integral part of caring for the children.[22,26-28]

Limitations

The SAPAC has been validated in preadolescents but very few Latino children were included.[17] Known concerns with the validated SAPAC pertinent to our study include the facts that Latinos' data were less strongly correlated (although the group was not large enough to provide sufficient power to test for statistical significance), and children tend to overreport physical activity.[29] However, other studies have shown that the SAPAC tool is a reliable metric of physical activity in Latino adults.[30] And because children tend to overreport physical activity, consistent with tool developer recommendations, we used the SAPAC as a relative measure of activity rather than an absolute measure.

The sample was drawn from a clinic in Forsyth County with participants willing to participate in a healthy lifestyle program, which may have limited generalizability. However, this clinic is one of the predominant clinics to provide health care to Latino immigrant families in the region and might offer us a glimpse into the less acculturated Latino family. Moreover, given that the respondents revealed a wide variation in reported physical activity and social influences, the data allow us to examine trends that can inform future interventions.

Future Research

Future pediatric obesity programs for Latino patients need to use the concept of social influences, including the effect of family and extended family, when considering mechanisms for changing physical activity behaviors in Latino children.

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Table 1

Sample Demographics

Variable	Sample Value
N	114
Mean age (SD)	9.78 (1.21)
Male percentage	47.4
Mean BMI (SD)	26.2 (4.9)
BMI range	19.2-45.9
No. of patients overweight (%)[a]	30 (26.3)
No. of patients obese (%)[b]	84 (73.7)

Note: SD = standard deviation; BMI = body mass index.

[a] BMI ≥ 85 percentile, <95% adjusted for sex and age.

[b] BMI ≥ 95 percentile adjusted for sex and age.

Table 2

Descriptive Statistics for the Independent and Dependent Variables

Dependent and Independent Variables	Scale Range	Mean (SD)	Range in Sample
Physical Activity Scale	0-546	172.0 (92.9)	0-512
Self-Efficacy Scale	0-6	4.68 (1.40)	0-6
Beliefs Scale	0-12	9.48 (1.45)	5-12
Social Influences Scale	0-6	3.83 (1.64)	0-6

Note: SD = standard deviation.

Table 3

Mixed Effects Regression Results With MET-Adjusted Activity Score as the Outcome Variable

Effect	Estimate	Standard Error	*P* Value
Child age	5.69	6.17	.39
Child sex[a]	0.28	16.43	.99
Social influences	21.75	5.31	<.01
Beliefs	–2.16	5.23	.69

Note: MET = metabolic equivalent.

[a]Female is the reference category.