



Physical Activity among Older American Indians and Alaska Natives

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Physical Activity among Older American Indians and Alaska Natives

Abstract

Introduction: Life style behaviors contribute to poor health among older Americans Indians/Alaska Native (AI/AN) in the United States, with low levels of physical activity (PA) particularly tied to the chronic disease profile of this population. Searched reviews of physical activity among AI/ANs are limited in assessing prevalence and correlates to PA among older adults > 40 years.

Methods: A literature search of reported physical activity studies among older AI/AN was assessed for prevalence and predictive factors associated with levels of physical activity.

Results: Fourteen studies were included in this review that either specifically quantified the amount of physical activity among older adult AI/ANs or discussed factors that were associated with physical activity. Being younger, employed, male, perceiving social support are associated with higher levels of physical activity. Urban versus rural living shows varying effects, possibly due to different types of activities not represented on standard physical activity reporting tools.

Discussion: There is a trend for physical activity levels among older AI/ANs to be less than the recommended levels. Reports of physical activity across a wide range of tribes and localities vary with measurement methods contributing to the unevenness in reporting.

Conclusion: Findings may serve to guide physical activity research toward more localized and culturally relevant assessment and inform practice agendas among older AI/AN.

Keywords

Indians; Native Americans; risk factors; heart diseases; health knowledge; attitudes; practice; risk assessment.

Cover Page Footnote

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Hispanic Representation in a Longitudinal Birth Cohort Study

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ABSTRACT

Background: The purpose of this paper is to report: 1) strategies used to engage Hispanic women and their families in a longitudinal birth cohort study, and 2) comparisons of Hispanic and non-Hispanic groups that received those strategies. This paper augments the current literature by reporting methods and results specific to a subpopulation of Hispanic women, that of self-identified Mexican women. Comparisons between Hispanic and non-Hispanic groups that received those strategies will build the evidence base that supports effective outreach and engagement strategies.

Methods: Cultural responsiveness theory was used to structure outreach and engagement, including: 1) assembling a culturally competent team; 2) partnering with community organizations; and 3) creating a personalized marketing and media campaign. For the purposes of evaluating the effectiveness of the outreach and engagement strategies, respondents were asked two questions about outreach and engagement efforts during a screening interview.

Results: Hispanic women were proportionally represented in the sample. Just over 43% of the women who completed the pregnancy screening instrument were Hispanic. This rate is similar to the percentage of age-eligible Hispanic women living in the recruitment area. Over half (52%) of the consented women were Hispanic. Overall, 63% of the respondents (n=1273) reported having heard about the study during the screening interview. Among Hispanic respondents (n=871), a little over half (52%, n=453) responded affirmatively. Among non-Hispanic respondents (n=1135), most (72%, n=813) had heard of the NCS.

The top three ways that both Hispanic and Non-Hispanic respondents heard about the NCS were through the advance letter, household enumeration, and radio. Both groups reported hearing about the NCS through “Community partners/outreach events” with similar frequency.

Discussion: Demographic changes in America speak to the importance of developing outreach and engagement plans tailored to Hispanic populations. Cultural responsiveness theory provided a multi-faceted framework that was used to engage Hispanic families in a study of children’s health and their environment.

Keywords: Community outreach; Research subject recruitment; Hispanic Americans; Rural Population; Women

INTRODUCTION

Hispanic, female representation in epidemiological studies of children’s health is necessary in order to generalize study findings to children living in the United States. Multiple barriers to the recruitment of women and minorities in research have been identified, including: fear, distrust of the research enterprise, lack of exposure to clinical research, interference with work and/or family responsibilities, subject burden, financial costs, and a lack of tangible benefits resulting from participation (Ejiogu et al., 2011; Ford et al., 2008; U.S. Department of Health and Human Services, 2003). Strategies to improve the recruitment of women and minorities in research have also been identified, such as establishing an explicit outreach plan, achieving agreement on research plans, working through community-based organizations (CBO), using lay health workers, and maintaining communication with the study population (U.S. Department of Health and Human Services, 2003; Yancey, Ortega, & Kumanyika, 2006).

While these recommendations are helpful, outcomes comparing specific recruitment strategies between groups are infrequently reported. In addition, heterogeneity between and within groups limits extrapolation between studies (Yancey et al., 2006). For example, social marketing has been successful in recruiting “minority” populations into clinical research (Gilliss et al., 2001; UyBico, Pavel, & Gross, 2007), but face-to-face recruitment and working through community partners have been shown to be the most successful strategies for recruiting Hispanic, often Spanish-speaking, participants (Gilliss et al., 2001; Horowitz, Brenner, Lachapelle, Amara, & Arniella, 2009; Larson, Ferng, Wong-McLoughlin, & Wang, 2009; Reidy, Orpinas, & Davis, 2012; Rodriguez, Rodriguez, & Davis, 2006).

The National Children Study (NCS) provided a recent opportunity to engage and recruit Hispanic women into a longitudinal birth cohort study. The purpose of the NCS was to examine the effects of the environment on children’s health and development (National Children's Study, 2012). Across the United States (U.S.), 105 study locations were initially identified to recruit a nationally representative birth cohort. Recruiting a representative sample was dependent upon recruiting ethnically diverse women from urban and rural locations. NCS study locations ranged from urban areas such as Queens, New York, where over 100 languages are spoken (Trasande et al., 2011), to primarily white, rural areas such as the Northern Plains site (Fahrenwald, Wey, Martin, & Specker, 2013). Outreach and engagement was critical to recruitment and needs to be tailored to the characteristics of the different study communities (National Children's Study, 2009).

The Pacific Northwest Center for the National Children’s Study (PNWNCS) recruited participants from Grant County, Washington (WA), a large (over 2,600 mi²), ethnically diverse, agricultural region with low population density (33.3 persons/mi²). Grant County lies in the

central part of Washington State where irrigated agriculture (e.g. orchards, vineyards) and related businesses (e.g. food processing) dominate the economy. Between 2000 and 2010, Grant County experienced a 19% increase in the overall population and a 52% increase in the Hispanic population (U.S. Census, 2013). According to the 2007-2011 American Community Survey 5-year estimates, over a third (37.48%) of the population in Grant County was of Hispanic or Latino origin, 92.35% of whom identified as Mexican (U.S. Census, 2011a). Among the Hispanic population, 80.48% reported speaking Spanish at home (U.S. Census, 2011b). Foreign born persons constituted 17% of the population (2007-2011), most of whom were not naturalized citizens (Eastern Washington University Institute for Public Policy and Economic Analysis, 2013; U.S. Census, 2013). In 2011, 54% of births were of Latino ethnicity (WA State Department of Health, 2013). Ensuring Hispanic representation in the sample was a recruitment goal.

The purpose of this paper is to report: 1) strategies used to engage Hispanic women and their families in a longitudinal birth cohort study, and 2) comparisons of Hispanic and non-Hispanic groups that received those strategies. This paper augments the current literature by reporting methods and results specific to a subpopulation of Hispanic women, that of self-identified Mexican women. Further, comparisons between Hispanic and non-Hispanic groups that received those strategies will build the evidence base that supports effective outreach and engagement strategies.

METHODS

The National Children's Study in Grant County, WA

The PNWNCS used household-based recruitment to invite women in Grant County, WA to participate in the NCS. Subjects were recruited within randomly selected, pre-determined geographical areas ("segments") to produce an approximately representative sample of births within the study location. Briefly, this strategy involved visiting homes door-to-door in select study segments ("Enumeration"), administering the "Pregnancy screener" questionnaire in English or Spanish to determine study eligibility, and consenting women if interested. Notably, 15% of women completed the pregnancy screener in Spanish. A woman was eligible if she lived in a segment, was 18-49 years of age, and was pregnant or trying to conceive at the time of the pregnancy screener interview, per self-report. At least one week prior to the door-to-door recruitment, residents received a phone call, an advance letter and a post card alerting them to ensuing NCS activities. Recruitment was "rolling" such that it generally occurred in 1-2 segments (of 8) at a time throughout the recruitment period. Outreach and engagement activities occurred before recruitment commenced and continued throughout the recruitment period, as described below.

For the purposes of evaluating the effectiveness of the outreach and engagement strategies, respondents were asked two questions during the pregnancy screener interview: 1) "Have you heard about the NCS?" Response options included "yes"; "no"; "don't know", and 2) "How did you hear about the NCS?" They were given 22 response options, including: an advance letter mailed by NCS, community partners/outreach event, continuous tracking of a dwelling unit, co-worker, family member, friend, household enumeration, neighbor, other, other health care provider, other NCS respondent, prenatal care provider, print media, radio, religious organization, school, self/respondent referral, social networking media, TV, WIC or other social agency, refused, and don't know. Respondents could select multiple options. Descriptive

statistics were used to analyze the data in Microsoft Excel. All study procedures were approved by the university institutional review board.

Conceptual framework guiding outreach and engagement in Grant County, WA

Cultural Responsiveness Theory (CRT) was used to structure the outreach and engagement plan. The theory emphasizes the shared knowledge, attitudes, and values of researchers and participants, recognizing that these may be facilitated by shared gender, ethnicity, and language. However, while “matching” researcher and participant on such variables should increase understanding and enhance cooperation and enrollment, the authors suggest that “attitude similarity is a more powerful determinant of attraction toward and influence by the source than is group membership” (p.2). CRT was fitting due to the differences in social position among the research team and potential participants. First, no member of the research team lived in Grant County. This outsider/insider phenomenon influences the acceptance of health care providers, and by extension health science researchers, in rural communities (Long, K.A. & Weinert C., 2006). As such, we did not assume that we shared knowledge, attitude, and values with potential participants. In addition to the urban/rural divide, the researchers were primarily non-Hispanic white, monolingual, upper middle class men and women with graduate degrees. No member of the research team that was regularly present in Grant County was pregnant or had a high probability of becoming pregnant, further distinguishing the team from potential participants. Since we did not match socially and could not take for granted that we shared attitudes and values with the study community, we employed the CRT to guide our outreach and engagement plan. CRT has been shown to increase minority participation in research via influencing the attitudes of community members (Flaskerud & Akutsu, 1993; Flaskerud & Hu, 1993; Flaskerud & Nyamathi, 2000; Sue, Fujino, Hu, Takeuchi, & Zane, 1991).

Cultural competence is central to CRT and includes “attributes of cultural knowledge, cultural sensitivity, and collaboration with participants” (Flaskerud & Nyamathi, 2000, p. 3). Two values that have been identified as being core to Hispanic culture include *familism* and *personalismo*. *Familism* has been defined as “a cultural value that involves individuals’ strong identification with and attachment to their nuclear and extended families, and strong feelings of loyalty, reciprocity, and solidarity among members of the same family” (Marin & Marin, 1991, p. 13). The second value, *personalismo*, is a partiality for close, personal (versus institutional) relationships. Research studies support the role that face-to-face interactions play in recruiting Hispanic participants, illustrating the importance of *personalismo* (Reidy et al., 2012).

The outreach and engagement plan had three main components, including: (1) assembling a culturally competent team; (2) partnering with CBOs; and (3) creating a personalized marketing and media campaign. These components approximated the trajectory of outreach and engagement activities as they unfolded alongside study activities.

Assembling a culturally competent team

The closest academic health science center to Grant County is over 100 miles away. The County’s general workforce and community agencies were, in general, inexperienced with working in a research-intense environment. Thus, approximately six months before recruitment commenced, we assembled a Community Advisory Committee (CAC). Three members, among 15, were Hispanic, bilingual women. One of the Hispanic representatives was a member of the WA State Commission on Hispanic Affairs, a school board member, and an early childhood education specialist. Another Hispanic representative was a parent educator who worked for a family literacy program. The third Hispanic representative was a *promotora de salud* (health promoter) who worked for the local federally qualified health center (FQHC). Other non-

Hispanic members, such as the director of maternal support services at the FQHC and a public health nurse served Hispanic families through their work. Additional CAC members were selected to focus on County-wide engagement. For example, a County Commissioner served alongside the County's emergency management public information officer, an economic development director, and the president of a local business association.

Our field office staff was hired from within the community. Our local outreach team included a bilingual, Hispanic cultural liaison and a second outreach coordinator who focused on County-wide efforts. Home interviewers were hired into temporary positions through a Grant County-based temporary personnel agency that was able to relate relevant work experience within the rural community to the job requirements of the research study. These interviewers represented the cultural diversity of the study community, had insider knowledge of the community and culture, and had pre-established relationships with residents.

Partnering with community-based organizations (CBO)

We held information sessions and hosted outreach events with CBOs four months before recruitment commenced. *Personalismo* was supported by providing information to people who regularly work with potential participants and who the community trust as credible. For example, the FQHC that we partnered with serves farm worker and low-income families. The FQHC's *Promotores de Salud* program is staffed by Hispanic, bilingual and bicultural volunteers, most of whom are also members of farm worker families. They served as liaisons between the research team and the farmworker families in this community. Likewise, the Migrant Council staffs their sites with Family Outreach Workers, who are also bilingual and bicultural. Informational sessions were held with both groups to build awareness about the study through formal (e.g. community events) and informal (e.g. church networks) communication channels.

Familism was supported by participation in family-focused outreach events with both of the aforementioned groups. We participated in parades, and had informational tables with games and gifts at health and back-to-school fairs in agricultural communities, county-wide Hispanic music festivals, and individual town's harvest festivals. Over the course of a year, the outreach team participated in approximately 50 events and made 40 presentations to Hispanic and non-Hispanic audiences to increase the awareness about the study.

Creating a personalized marketing and media campaign

Mass marketing and media were used to ensure that potential participants heard about the NCS before door-to-door recruitment. We primarily relied on radio for our media campaign to Hispanic and non-Hispanic residents, per the recommendation of the CAC. Local radio announcers read scripts we developed to leverage the relationship that listeners already had with their preferred radio personalities. Over 3000 thirty-second radio spots were run throughout the County, 414 of which were in Spanish on stations recommended by the CAC. (Notably, Spanish radio has a smaller market share than English radio in the county.)

We personalized our marketing and media campaign by featuring a photograph of our Hispanic liaison on printed materials, which included posters, brochures, and newspaper advertisements in Spanish and English. Over 28,000 pieces of outreach material were distributed to Hispanic and non-Hispanic audiences at schools, day care centers, clinics, businesses, post offices, libraries, and churches within a month of recruitment commencing. Approximately half of these materials were in Spanish. For three months during recruitment, paid advertisements in the largest regional newspaper ran multiple times a week. Flyers were inserted into four newspapers (three of which were bilingual) before recruitment commenced in the related segment. We used images of Latino families illustrating the value of *familism* on our website and

billboard, which was located in a heavily Hispanic area and advertised the NCS for one month in English and over a month in Spanish.

Determining the expected number of Hispanic respondents.

The NCS strategy was to recruit subjects from statistically determined areas of the county (segments) based on aggregations of Census Blocks defined in the 2000 U.S. Census of Population and Housing. Since recruitment took place in 2010-11, we used the 2010 Census to provide an updated count of the expected number of age-eligible Hispanic respondents. We utilized a geographic information system (ArcGis) to identify the 2010 Blocks enclosed by the original (2000) area boundaries. The resulting set of 2010 Blocks, and their unique identifiers, allowed us to extract the required variables (P12 “Sex by age” and P12H “Age by sex, Hispanic/Latino”) from the 2010 Census Summary File 1. This yielded the expected (2010) number of age-eligible respondents and age-eligible Hispanic respondents for the study area.

RESULTS

According to the 2010 U.S. Census, 4569 age-eligible women lived in the NCS segments with 1952 (43%) identifying as Hispanic (Table 1). The proportions of Hispanic women that were represented among those completing the pregnancy screener and among those consenting to participate were equal to or exceeded the proportion of age-eligible women in the Grant County study segments. Of the 2016 women who completed the pregnancy screener, ethnicity data were available for 2006 women. Among these 2006 women, 43% (n=871) were Hispanic and 57% (n=1135) were non-Hispanic. Two hundred and seventy women were eligible to join the study based on their responses to the pregnancy screener. Of those 270 women, 51% (n=137) were Hispanic and 49% (n=133) were Non-Hispanic. Of the 270 eligible women, 59% (n=159) consented to participate. Among the consented women, ethnicity data were available for 150 women. Of those 150 women, 52% were Hispanic (n=78), which exceeded the proportion of Hispanic age-eligible women in the Grant County study segments per the 2010 Census data (43%).

Table 1. A Comparison of Age-Eligible Women Living in NCS Segments and Participating in Study Activities

	Total	Hispanic	Non- Hispanic
Age-eligible women living in NCS segments	4,569	1,952 (43%)	2,617 (57%)
Women who completed pregnancy screener	2,006 ^a	871 (43%)	1,135 (57%)
Women eligible to join the study	270	137 (51%)	133 (49%)
Women who consented to participate	150 ^b	78 (52%)	72 (48%)

^a2016 completed screener but ethnicity data was only available for 2006

^b159 women consented but ethnicity data was only available for 150 women

Of note, there was a higher percentage of Hispanic women eligible to join the Study than Non-Hispanic women (Table 2). Of the 871 Hispanic women who completed the pregnancy screener, 137 (16%) were eligible to join, which is greater than the percent (12%) of non-Hispanic women (n=133 of 1135) who were eligible to join. Of the 137 eligible Hispanic women, 57% (n=78) consented to participate compared to 54% (n=72) of the 133 eligible non-

Hispanic women. This could be one explanation for the higher percentage of Hispanic women that joined the study.

Table 2. A Comparison of Eligibility among Hispanic and Non-Hispanic Women

	Total	Eligible	Not Eligible
Hispanic women who completed the pregnancy screener	871	137 (16%)	734 (84%)
Non-Hispanic women who completed the pregnancy screener	1,135	133 (12%)	1,002 (88%)

As part of the administration of the pregnancy screener, all respondents (n=2016) were asked “Have you heard about the NCS?” Overall, 63% of the respondents (n=1273) responded affirmatively. Among Hispanic respondents (n=871), a little over half (52%, n=453) responded affirmatively. Among non-Hispanic respondents (n=1135), most (72%, n=813) had heard of the NCS.

Respondents were also asked “How did you hear about the NCS?” Among 1,837 total responses (Table 3), the top three ways that both Hispanic and Non-Hispanic respondents heard about the NCS were through the advance letter, household enumeration, and radio. Both groups reported hearing about the NCS through “Community partners/outreach events” with similar frequency. Notably, print media was reported more frequently as a source of study information for Non-Hispanic respondents than Hispanic respondents, whereas “other NCS participants” was more frequently reported among Hispanic respondents than Non-Hispanic respondents. Fewer than 4% in both groups reported: Family member, WIC or other social agency, Friend, Religious organization, Co-worker, Prenatal care provider, Social networking media, Neighbor, Self/participant referral, don’t know, Continuous tracking of dwelling unit. No one refused the question.

Table 3. Reported Ways that Women Heard about the NCS, by Ethnicity

Response Category	Total		Hispanic		Non-Hispanic	
	(N)	(%)	(N)	(%)	(N)	(%)
Advance letter	491	26.73%	155	25.41%	333	27.38%
Radio	239	13.01%	56	9.18%	181	14.88%
Household enumeration	218	11.87%	86	14.10%	130	10.69%
Community partners/outreach events	163	8.87%	55	9.02%	108	8.88%
Print media	146	7.95%	29	4.75%	116	9.54%
School	101	5.50%	45	7.38%	56	4.61%
Other	90	4.90%	32	5.25%	58	4.77%
Other NCS participant	80	4.35%	50	8.20%	29	2.38%
TV	76	4.14%	24	3.93%	51	4.19%
Other health care provider	67	3.65%	30	4.92%	36	2.96%
Family Member	41	2.23%	14	2.30%	27	2.22%
Friend	34	1.85%	8	1.31%	26	2.14%
Co-worker	25	1.36%	4	0.66%	21	1.73%
WIC or other social agency	23	1.25%	11	1.80%	12	0.99%

Social networking media	14	0.76%	2	0.33%	12	0.99%
Prenatal care provider	9	0.49%	2	0.33%	7	0.58%
Religious organization	7	0.38%	4	0.66%	3	0.25%
Neighbor	7	0.38%	1	0.16%	6	0.49%
Don't know	3	0.16%	1	0.16%	2	0.16%
Continuous tracking of DU	2	0.11%	1	0.16%	1	0.08%
Self/participant referral	1	0.05%	0	0.00%	1	0.08%
Refused	0	0.00%	0	0.00%	0	0.00%
Total	1837^a		610		1216	

^a 1837 answered this question on the screener but ethnicity data was only available on 1826

DU = dwelling unit

DISCUSSION

Hispanic representation in the Grant County sample was an important recruitment goal. Anticipating demographic changes by incorporating Hispanic values in the outreach and engagement strategy may have contributed to the inclusion of Hispanic women in the sample. Determining what constituted a representative sample involved estimating the number of age-eligible, Hispanic women in the sample segments, while accounting for dramatic demographic shifts over time. The increase in the Hispanic population in Grant County between 2000 and 2010 (52%) outpaced national trends. Between 2000 and 2010, the rural (non-metropolitan) Hispanic population in the United States grew by 45%, faster than any other racial or ethnic minority group (Lichter, 2012). The proportion of Hispanic women responding to the pregnancy screener (43%) was consistent with the proportion of age-eligible Hispanic women in the Grant County study segments. Of the eligible Hispanic women, 52% consented to participate. A contributing factor to the high number of Hispanic women consenting may be the higher percentage of Hispanic women that were eligible to join (16% versus 12%). These demographic changes in rural America speak to the importance of developing outreach and engagement plans tailored to Hispanic populations.

Overall, the percentage of Grant County respondents that reported having heard about NCS (63%) was higher than reported at the Orange County (30%) and the 4-county Northern Plains site (53%) (Baker et al., 2011; Fahrenwald et al., 2013). The percentage of Hispanic respondents in the Grant County sample that reported hearing about the NCS was lower (51%) than for Non-Hispanic respondents (72%), but was similar to the overall rate of the Northern Plains site (53%). Although fewer Hispanic respondents had previously heard about the NCS than Non-Hispanic respondents, their response rates to the pregnancy screener and their consent rate were both higher than expected, based on literature identifying barriers to recruitment in this population and the results of the Census data inquiry. That said, only half of the Hispanic respondents had heard about the study at the time of the interview. Among those that did, most (39.51%) heard about it through systematic, household-level strategies including receiving the advance letter and household enumeration. Not having heard of the NCS did not seem to impede their participation in study activities. This success may be attributable to the home interviewers, the first point of contact for those participants. Consistent with CRT, the home interviewers were locally hired and trained in cultural competence by a Hispanic community leader. Teams included a bilingual interviewer. Home interviewers participated in outreach events (e.g. parades) that occurred before recruitment began which facilitated a mutual introduction between the NCS staff and the segment community.

By hiring locally, the staff hired reflected the county, and represented a cross-section of age, gender, ethnicity, and academic backgrounds. This was important as local staff provide a “bridge” between researchers, community partners and community members at-large (Israel, et al, 2005). Working knowledge of the rural setting and familiarity with specific Grant County demographic characteristics was expected and was reflected in the staff’s ability to implement the study. A major strength of the staff from the temporary agency was their expertise relating the relevance of prior work experience to the qualifications of the field interviewer position. In Grant County, prior jobs relevant to the field interviewer position included factory line workers and inspectors, US Census takers, clerical assistants, retailers, and small business owners. None of the applicants had previous research experience.

Differences in how respondents heard about the study need to be considered in the context of the outreach and engagement plan, our ability to execute the plan, and evaluate the results. Some strategies (i.e. household enumeration, the advance letter) were systematically applied to all potential households. Other strategies, such as attending outreach events, sending brochures home through schools and day cares, and distributing brochures in public places, were applied consistently across Hispanic and Non-Hispanic majority communities. Responses among Hispanics and No-Hispanics reflect these choices, whereas the differences in their responses to how they heard about the study were less than 5%.

In contrast, differences in advertisement buys in English versus Spanish print newspaper media and radio were substantial. For example, we purchased approximately seven times more radio advertisements in English than in Spanish due to the larger English-language radio market in the County. We also ran paid advertisements multiple times per week in English language newspapers due to the larger English-language newspaper market in the County. Although radio was one of the top three ways that Hispanic respondents heard about the study, there is a notable (>5%) difference between Hispanics and Non-Hispanics in their frequency of reporting radio as a way to hear about the study. Similarly, Non-Hispanics were more likely to report print media as a source of information about the study than Hispanics. It is difficult to draw conclusions about print media, however, because to a respondent print media may or may not include brochures which, in our case, would overlap with hearing about the study through schools. Previous studies report poor results (2-3%) from distributing flyers to build study awareness among Hispanics, but respondents may feel differently if the brochure is coming from a trusted source, such as a teacher, versus being handed out at a grocery store (Larson et al., 2009; Rodriguez et al., 2006).

Having heard about the study through another NCS participant was an important difference between Hispanics and non-Hispanics that did not relate to differential exposure to our outreach and engagement plan. This may reflect an important cultural difference between these groups, such as the impact that *personalismo* has in sharing study information with each other through word-of-mouth. The relative importance of this approach is consistent with the literature and suggests that a multifaceted approach to outreach and engagement was strategic for reaching the Hispanic population (Horowitz et al., 2009; Larson et al., 2009; Rodriguez et al., 2006). The importance of maintaining participants’ confidentiality precluded our ability to explicitly ask enrolled participants to reveal their participation status in the study in order to refer friends. Rather, we planned outreach events that were social in nature to cultivate conversations about the study.

Finally, it was not surprising that few women reported hearing about the NCS through health and social service providers given that our outreach plan did not rely on these providers to

actively build awareness of the NCS with their clients. This finding is consistent with other studies (Fahrenwald et al., 2013; Horowitz et al., 2009). Provider offices displayed brochures, but we did not anticipate this approach would garner much enthusiasm for the NCS without personal interaction between the provider and the client.

Our findings suggest that a multi-faceted framework was useful in engaging Hispanic women in a longitudinal birth cohort study. The combination of our culturally competent team, our systematic outreach approaches at the household-level, and our consistent presence at outreach events at the community-level were central elements of our outreach and engagement plan that emphasized cultural values of importance to Hispanic audiences. Also important, but less consistently applied, was our paid media campaign. Future efforts will place more emphasis on the media as a complementary tool to build study awareness.

Study limitations.

The study design precluded us from studying the influence that theoretical elements had on recruitment, such as the value that participants placed on *familism*. We were limited to measuring if respondents heard about the study and if so, how they heard about the study. The use of a standardized questionnaire to capture this information was a second limitation. While a standardized questionnaire facilitates comparisons across sites, response options may have confused local respondents. For example, we do not know how respondents categorized hearing about the NCS through *promotoras*. In Grant County, *promotoras* are employed by the FQHC, participate in community outreach events, and many are church leaders. Thus, respondents could have selected other health care provider, community partners/outreach events and/or religious organization if they heard about the NCS from a *promotora*. In rural communities, people wear numerous “hats” and are immersed in social networks (Lauder, Reel, Farmer, & Griggs, 2006). This phenomenon may be reflected in how respondents selected how they heard about the NCS. A third limitation is the differential application of outreach and engagement strategies across English and Spanish media. This prevents conclusions from being drawn about the effectiveness of particular strategies. Finally, we were not able to ask what motivated women to join the study. Asking this question would help us understand if certain strategies led more credibility to the study than other strategies and provide insight as to the relative importance of one approach versus another.

CONCLUSION

Hispanic representation in epidemiological studies of children’s health is important such that study findings can be generalized to children living in the United States. Tailored outreach and engagement plans that reflect core cultural values may positively influence recruitment, enrollment and generalizability of study findings. The inclusion of Hispanic populations in national studies is crucial if findings are to reflect demographic changes in America.

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