Using biomarkers for the validation of Niños Sanos, an obesity risk assessment tool: Preliminary results

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OVERVIEW

Spanish speaking parents with a 3 to 5 year old child were recruited from Head Start and WIC sites of Yolo and Sacramento counties (CA) to participate in the Niños Sanos study. Over a 6 week period, parents completed Niños Sanos, the Spanish version of Healthy Kids, a 45-item pediatric obesity risk assessment tool, and provided 24 hour food, sleep and activity logs. We collected blood from children for biomarkers analysis. A higher NS score (healthier behaviors) on the 13-item BMI subscale was associated with smaller child waist circumference (p=0.056) but not predictive of lower BMI percentile for age. A higher NS score on the 3-item sweet sugar beverages (SSB) subscale was associated with a healthier lipid index, p=0.09 and a lower triglycerides to glucose ratio, p=0.056, an index of insulin resistance. These preliminary data suggest that Niños Sanos promises to be useful tools to identify parenting behaviors that can potentially set children on a pathway for unhealthy weight gain.

BACKGROUND

Obesity disproportionately affects 2 to 5 year old Hispanic children and recent projection data (Ward, Z. J. et al. NEJM 2017) estimated that the majority of these obese 2 year-old will become obese adults. Equally concerning is that this model predicts that the majority of obese adults will become obese adults. Equally concerning is that this model predicts that the majority of obese adults will become obese adults. Equally concerning is that this model predicts that the majority of obese adults will become obese adults. Equally concerning is that this model predicts that the majority of obese adults will become obese adults.

As parents have direct influence over their children lifestyles, this young age is ideal for intervention to establish preventive behaviors. Yet, there are limited validated culturally appropriate pediatric obesity risk assessment tool to properly identify the eating, sleep and activity behaviors that set young children for unhealthy weight gain.

OBJECTIVE

To validate Niños Sanos, a pediatric obesity risk assessment tool designed for use with low-literacy Spanish speaking parents.

DESCRIPTION

Study Design: This is a cross sectional study. Data were collected at 5 time points (T1 to T2) over a 6-8 week period.

Data Collection: Participants were recruited by direct contact at Head Start (n=10) and WIC (n=3) sites in the Sacramento region (CA). Interested parents were enrolled at T1 by signing a consent form. Data were collected in person (T1, T2 and T5) and by phone interviews (T3, T4). Parents completed the Niños Sanos tool at T2. Convergent validity of NS was assessed using subjective (parental surveys and 24-hour diet log) and objective (anthropometric and biomarkers) measures, collected at T5. Data were collected by trained staff in Spanish using Spanish tools and surveys. Participants’ retention was good (75% of parents completed T5) and a blood sample was collected at ~92% of T5 visits. Blood was collected (max 15 ml) on fasted children with normal body temperature by a certified nursing staff. The samples were kept on ice for transport and processing, and the recovered plasma and serum were stored until analyzed. Plasma glucose and a lipid panel were measured shortly after collection using standardized methods at the UCDMC Clinical Laboratory. Data were analyzed using SAS (version 9.4) with statistical significance set at P<0.10.

Participants: 167 parent-child pairs were enrolled in the study. Typically, parents were 33-year-old females (>98%). Hispanic (>99%), born in Mexico (>83%), and spoke Spanish primarily (>85%). A majority completed grade school (72%), most were unemployed (60%) and lived in a household composed of 2 adults (78%) and 2 or 3 children (63%). The children were 56.3% females with an average age of 52 months.

EVALUATION

70% of mothers were overweight (BMI >25) and 50% of these were obese (BMI >30). 31% of children were overweight (BMI percentiles for age > 85%) and 17% were obese (BMI percentiles for age >90%). The obesity rate in our cohort is higher than the national obesity prevalence in 2-5 year old children (13.9%, NHANES, 2015-2016).

High BMI percentiles adversely affected metabolism in 3-5 year old children. Children in the highest BMI percentile-for-age quartile have significantly higher lipid (296 ± 112), metabolic (117 ± 41) index, and larger waist circumference (58.3 ± 4.7) than children in the lowest BMI percentile-for-age quartile (209 ± 119, 92 ± 51) and (48.7 ± 2.4) respectively.

A higher parental score on the 3 item sweet sugar beverages subscale of Niños Sanos was associated with a healthier child lipid index (P=0.09), and a lower triglycerides to glucose ratio (P=0.056), an index of insulin resistance. A higher parental score on the 19 item BMI subscale was associated with a smaller child waist circumference (not shown).

CONCLUSION & IMPLICATIONS

An obesity risk assessment tool for Spanish speaking families is being validated using biomarkers. Preliminary data show a strong association between higher scores Niños Sanos subscales and children with healthier profile, which may reach statistical significance with a larger sample size. Niños Sanos promises to be a useful pediatric obesity risk assessment to identify lifestyle determinants specific to Spanish speaking families.

Supported by Agriculture and Food Research Initiative #2015-68001-23280 from the USDA National Institute of Food and Agriculture, Human Nutrition and Obesity.