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A Pilot Walking School Bus Program to Prevent Obesity in Hispanic Elementary School Children: Role of Physician Involvement With the School Community

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Introduction

Forty-three percent of Hispanic children, 6 to 11 years old, in the United States are overweight or obese.¹ Minority status and poverty in urban communities have been found to contribute to childhood obesity.^{2,3} Given the clear role of environmental contributors to obesity, physicians are increasingly asked to go beyond their clinical practice to support school and community programs that help prevent obesity.⁴ The Walking School Bus (WSB), an innovative program designed to cut down on traffic congestion while providing a safe way to walk children to school, may offer clinicians a novel approach to obesity prevention.⁵ Walking to school is an affordable mode of transportation that may help reduce the high prevalence of childhood obesity.⁶ This brief report outlines principal findings from a pilot WSB program used by school-based health center physicians in collaboration with their school and community. Full details of implementation are reported elsewhere.⁷

The University of New Mexico School-Based Health Center (UNM SBHC) provides primary care to a predominantly Hispanic elementary school located in the zip code area with the highest percentage of families less than 185% of the federal poverty level in Albuquerque. Student obesity was voiced as a concern by parents and teachers to SBHC physicians at the elementary school. This prompted UNM SBHC to collaborate with the school and community to test the feasibility of a modified WSB program as a strategy to prevent obesity among the elementary school students.

Methods

Kindergarten through fifth-grade students were recruited through classroom presentations by an SBHC physician to 2 WSBs that ran sequentially from March to May 2006 for 10 weeks. Students residing within 1 mile of the school were eligible. WSB chaperones were parents or relatives of student participants. Parental consent and child assent were obtained. The study was approved by the University of New Mexico Human Research Review Committee and the Albuquerque Public Schools Research, Development and Accountability Department.

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Declaration of Conflicting Interests

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Students and their parents met with SBHC physicians before and after the WSB trial to discuss students' body mass index (BMI) and recommendations for obesity prevention. Physicians who were fluent in Spanish met with students and their parents who preferred to communicate in Spanish. Participants walked on designated routes with pick-up and drop-off locations approved for safety by the police department. Four health themes were emphasized during the walks by a premedical student fluent in Spanish and 2 medical students, one of whom was fluent in Spanish: (a) get up and play, (b) turn off your television, (c) eat 5 servings of fruit/vegetables per day, and (d) reduce soda/juice intake. Prizes (e.g., jump ropes, pedometers, Frisbees, and water bottles) were distributed every other week to reinforce health messages.

Pre- and postsurvey questions taken from the CDC 2005 Youth Risk Behavior Survey, 24-hour diet recalls, and height and weight measurements were performed to assess health outcomes. Measurements were obtained in the school's SBHC by UNM Clinical and Translational Science Center research nurses and nutritionists. Data were analyzed using paired *t* tests. Outcomes of interest included maintenance of BMI percentile, increase in physical activity, decrease in television viewing time, increase in servings of fruits/vegetables, and decrease in soda/juice intake.

Results

Twenty-eight students were enrolled, and 3 dropped out. The remaining 25 were Hispanic, with 56% reporting that Spanish was the preferred language at home. Participating students ranged from 5 to 11 years of age, and 64% were female. Seventy-six percent walked an average of 3 or more times per week. There were no reported injuries. BMI percentile remained stable among participants both overweight and not overweight. Physical activity increased from a mean of 4.3 days/week to 5.3 days/week ($P = .08$), and fruit serving consumption nearly doubled ($P = .01$) according to pre/post surveys (Table 1). Vegetable intake more than doubled by 24-hour diet recalls ($P < .001$). There were no significant changes in television viewing time and soda/juice intake.

Conclusion

The WSB appeared quite suitable to one of the poorest areas of town, with only 3 students dropping out. A majority of the students walked most days of the week. BMI percentiles remained stable during this short trial with improved self-reported changes in physical activity and nutrition.

Walking at any intensity expends energy⁸; therefore, a program of frequent walking such as the WSB may prevent excessive weight gain in growing children. Consistent with a Danish study that found children who walked to school had significantly higher overall levels of physical activity when compared with those traveling by car,⁹ our study also found an increase in physical activity days (although not statistically significant but trending toward significance). The addition of health themes may have also contributed to behavior change as seen by participants' report of increase in fruit and vegetable intake.

Future studies to more rigorously assess the effectiveness of the WSB should include a control group, greater sample size, and longer trial length and follow-up of participants. Our pilot WSB findings of BMI percentile maintenance in growing students coupled with obesity reduction behavior changes were encouraging. We believe that implementation of the WSB with associated health themes holds promise as an affordable childhood obesity prevention strategy that exemplifies the role physicians can play in school and community settings.

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Table 1**Student Outcomes**

Variable	Pre-WSB, Mean (SE)	Post-WSB, Mean (SE)	Pre-Post WSB, Difference (SE)	P Value
Anthropometrics (n = 25)				
Weight, kg	29.2 (2.1)	29.7 (2.1)	0.5 (0.1)	.001
Height, m	1.28 (0.02)	1.29 (0.02)	0.011 (0.002)	<.001
BMI	17.5 (0.8)	17.5 (0.8)	0.0 (0.1)	.85
BMI z score	0.00 (0.32)	−0.04 (0.32)	−0.04 (0.04)	.27
BMI percentile	50.8 (7.9)	49.3 (8.1)	−1.4 (0.8)	.10
Survey results (n = 23)				
Exercise, days/week	4.30 (0.49)	5.30 (0.43)	1.0 (0.55)	.08
TV, hours/day	1.50 (0.18)	1.63 (0.25)	0.13 (0.22)	.56
Fruit servings/day	0.83 (0.13)	1.59 (0.24)	0.76 (0.28)	.01
Vegetable servings/day	0.76 (0.12)	0.72 (0.14)	−0.04 (0.17)	.81
24-Hour diet recall results (n = 21)				
Fruit servings/day	1.82 (0.31)	1.22 (0.18)	−0.61 (0.33)	.08
Vegetable servings/day	1.29 (0.20)	2.79 (0.35)	1.50 (0.36)	<.001
Soda intake, g/day	121 (43)	220 (48)	99 (59)	.11
Juice intake, g/day	142 (37)	127 (29)	−15 (44)	.74

Abbreviations: WSB, walking school bus; BMI, body mass index.