8-17-2009

Results of a Pilot Walking School Bus Program to Prevent Obesity in Hispanic Elementary School Children

Nichole Burks

Christina Conklin

Alberta Kong

Carlos Roldan

Betty Skipper

See next page for additional authors

Authors
Nichole Burks, Christina Conklin, Alberta Kong, Carlos Roldan, Betty Skipper, and Susan Scott

Research Letter: Results of a Pilot Walking School Bus Program to Prevent Obesity in Hispanic Elementary School Children

Authors:

Alberta S. Kong, MD, MPH[1], Nichole Burks, BS[1], Cristina Conklin, BS[1], Carlos Roldan, BA[1], Betty Skipper, PhD[2], Susan Scott, MD[1]

[1]Department of Pediatrics

[2] Department of Family and Community Medicine

University of New Mexico School of Medicine

Corresponding Author: Alberta S. Kong, MD, MPH,

Address: Department of Pediatrics

MSC 10 5590, 1 University of New Mexico

Albuquerque, NM 87131-0001

Telephone: (505) 272-4462

Fax: (505) 272-4857

Email: akong@unm.edu

Word Count: 616

Number of tables: 1

Key words: Walking, Obesity Prevention, Children, School health

Thirty-three percent of children, 6-11years, in the US are overweight or obese.[1] Walking to school is an affordable mode of transportation that may help reduce this high prevalence of childhood obesity.[2] The Walking School Bus (WSB) is an innovative program designed to cut down on traffic congestion while providing a safe way to walk children to school.[3] We are aware of no published studies examining the impact of this specific program on obesity prevention. In addition, low-income and minority neighborhoods have been underrepresented in the walkability literature.[4] Therefore, we tested the feasibility of a modified WSB program in a low-income minority neighborhood as a strategy to prevent childhood obesity.

Kindergarten through 5th grade students from a predominantly Hispanic elementary school located in the zip code area with the highest percentage of families under 185% of the federal poverty level in Albuquerque, New Mexico, were recruited to two WSBs that ran from March to May 2006 for 10 weeks. Students residing within one 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.

Students 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: (1) get up and play, (2) turn off your television, (3) eat five servings of fruit/vegetables per day, and (4) reduce soda/juice intake.

Pre/post questions taken from CDC 2005 Youth Risk Behavior Survey, 24-hour diet recalls, and height and weight measurements were performed to assess health outcomes. Measurements were obtained at the school-based health clinic. 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.

Twenty-eight students were enrolled. Three dropped out. Remaining 25 were Hispanic with 56% reporting that Spanish was the preferred language at home, ages were 5-11 years, and 64% were female. Seventy-six percent of participants walked an average of three or more times per week. There were no reported injuries. BMI percentile remained stable among both overweight and non-overweight participants. Physical activity increased from a mean of 4.3 days/week to 5.3 days/week ($p=0.08$) and fruit serving consumption nearly doubled ($p=0.01$) according to pre/post surveys (Table 1). Vegetable intake more than doubled by 24-hour diet recalls ($p<0.001$). There were no significant changes in television viewing time and soda/juice intake.

The WSB was feasible even in the poorest area of the city with only three students dropping out. Majority of the students walked most days of the week. BMI percentiles remained stable with improved self-reported changes in physical activity and nutrition.

Walking at any intensity expends energy, [5] therefore; a program of frequent walking like 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, [6] our study also found an increase in physical activity days. The addition of health themes led to self-reported behavior change as seen by participants' increase in fruit and vegetable intake.

Future studies of the WSB should include a control group, greater sample size, and longer trial length and follow-up of participants which were limitations of this pilot study. The feasibility of the program, maintenance of BMI percentile and self-reported obesity reduction behavior changes are however promising. The WSB with health themes deserves further investigation as a potential childhood obesity prevention strategy from a public health promotion perspective.

References:

1. Ogden CL, Carroll MD, Flegal KM. High body mass index for age among US children and adolescents, 2003-2006. JAMA 2008;299(20):2401-2405.
2. Mackett RL, Lucas L, Paskins J, Turbin J. The therapeutic value of children's everyday travel. Transport Res Part A 2005;39:205-19.
3. RoadSafe Auckland. Walking School Bus. Available at: http://www.roadsafeauckland.org.nz/Schools/index.cfm?id=1040. Accessed July 16, 2008.
4. Day K. Active living and social justice: planning for physical activity in low-income, black, and Latino communities. J Am Plann Assoc 2006;72:88-99.
5. Morris JN, Hardman AE. Walking to Health. Sport Med 1997;5:306-333.

6. Cooper A, Andersen L, Wedderkopp A, Froberg P. Physical activity levels of children who walk, cycle, or are driven to school. American Journal of Preventive Medicine 2005;29(3):179-184.

Table 1: Outcomes of the Walking School Bus

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)	0.001
Height, m	1.28 (0.02)	1.29 (0.02)	0.011 (0.002)	<0.001
Body Mass Index, kg/m^2	17.5 (0.8)	17.5 (0.8)	0.0 (0.1)	0.85
Body Mass Index z-score	0.00 (0.32)	-0.04 (0.32)	-0.04 (0.04)	0.27
Body Mass Index percentile	50.8 (7.9)	49.3 (8.1)	-1.4 (0.8)	0.10
Survey results (n=23)				
Exercise days/week	4.30 (0.49)	5.30 (0.43)	1.0 (0.55)	0.08
TV hrs/day	1.50 (0.18)	1.63 (0.25)	0.13 (0.22)	0.56
Fruit servings/day	0.83 (0.13)	1.59 (0.24)	0.76 (0.28)	0.01
Vegetable servings/day	0.76 (0.12)	0.72 (0.14)	-0.04 (0.17)	0.81
24 hour diet recall results (n=21)				
Fruit servings/day	1.82 (0.31)	1.22 (0.18)	-0.61 (0.33)	0.08
Vegetable servings/day	1.29 (0.20)	2.79 (0.35)	1.50 (0.36)	<0.001
Soda intake, grams/day	121 (43)	220 (48)	99 (59)	0.11
Juice intake, grams/day	142 (37)	127 (29)	-15 (44)	0.74