

UCSF

UC San Francisco Previously Published Works

Title

Childcare does not increase obesity risk

Permalink

<https://escholarship.org/uc/item/3ph6f606>

Journal

Pediatric Obesity, 8(2)

ISSN

2047-6302

Authors

Zahir, N

Heyman, MB

Wojcicki, JM

Publication Date

2013-04-01

DOI

10.1111/j.2047-6310.2012.00125.x

Peer reviewed



HHS Public Access

Author manuscript

Pediatr Obes. Author manuscript; available in PMC 2015 October 24.

Published in final edited form as:

Pediatr Obes. 2013 April ; 8(2): e24–e28. doi:10.1111/j.2047-6310.2012.00125.x.

No association between childcare and obesity at age 4 in low-income Latino children

N. Zahir, M. B. Heyman, and J. M. Wojcicki

Department of Pediatric Gastroenterology, Hepatology and Nutrition, UCSF, San Francisco, CA, USA

Summary

Background—Previous studies have found an association between early entry to childcare and risk for overweight and obesity at 3 years of age. These studies, however, have been conducted primarily with higher income White populations or have found increased risk in the children of educated mothers.

Objective—To assess the relationship between timing of entry to childcare and duration of childcare and pediatric overweight and obesity in a high risk population.

Methods—Using data from a longitudinal cohort of low-income Latino children in San Francisco, we evaluated the association between time of entry to childcare, hours in childcare, and risk for overweight and obesity at age 4. Similarly, we evaluated the relationship between these same childcare parameters and body mass index Z score and risk of having a waist circumference (WC) percentile ≥90th at 4 years of age.

Results—In contrast with previous studies, we found no association between being in childcare at 4 years of age or number of hours per week in childcare and risk for childhood overweight, obesity or WC ≥90th percentile at age 4. Additionally, we found no association between age of entry to childcare (6 months or 12 months of age) with risk for overweight or obesity at age 4. Future studies need to further evaluate the differential impact of childcare on early childhood obesity in relation to race/ethnicity and lower socioeconomic status.

Conclusion—Low-income children may not be at increased risk for obesity in relation to early childcare exposure.

Keywords

Childcare; day care; Latino children; obesity; socioeconomic status

Address for correspondence: Dr JM Wojcicki, Department of Pediatric Gastroenterology, Hepatology and Nutrition, UCSF, 500 Parnassus Avenue, MU4E, San Francisco, CA 94134-0136, USA. wojcicki@gmail.com.

Conflict of interest statement

The authors have no conflicts of interest related to this study or the manuscript.

Introduction

Among pre-school-aged children, 2–5 years old, the prevalence of overweight or obesity was 26.7% in 2009–2010 in the United States (1). Children less than 2 years of age are also impacted with a prevalence between 17 and 26.8% in 2000–2001 (2). Pre-school-aged children who are obese are more likely to be obese in their adolescent years, as well as adulthood (3).

Previous studies have found that young children who have more childcare exposure have a higher body mass index (BMI) Z score or greater risk for overweight at age 3 (4), particularly if the childcare occurred in an informal setting (defined as being cared for by a friend, neighbour, grandparent, or other relative, babysitter or unregistered child minder) (5). It is not clear which aspects of childcare might facilitate risk for early weight gain. One previous, however, was conducted in the United States, in a high-income and primarily White population of children (4), while the other was focused in the United Kingdom, using the Millennium Cohort Study.

We have an ongoing study of risk factors for early childhood obesity in a lower income San Francisco-based Latino cohort as described elsewhere (6). Data from this unique population were used to test our hypothesis that increasing and early childcare exposure would increase the risk for overweight and obesity in Latino children. We evaluated the relationship between enrolment in childcare including hours in care and age of enrolment and risk for overweight and obesity at 4 years of age.

Research methods

Participants were recruited in pregnancy and followed annually in our cohort until 4 years of age as described elsewhere (6). In short, annual follow-ups consisted of anthropometric measurements including weight and height and waist circumference (WC) measurements on children. Maternal weight and height and WC were also measured annually. Age that childcare commenced and weekly childcare hours were surveyed retrospectively by asking mothers and current childcare practices were queried at age 4. Specifics about the type of child-care setting were not asked (e.g. whether the care was at a Head Start Centre or home-based care), although we did collect information on informal vs. formal care. The primary outcome of interest was child overweight and obesity, defined respectively as having a BMI \geq 85th percentile and \geq 95th percentile, using Centers for Disease Control and Prevention (CDC) guidelines (7). We also evaluated BMI Z score continuously as an outcome and WC \geq 90th percentile using CDC cut-points for abdominal obesity (8). The primary predictor of interest, hours in childcare, was analyzed continuously and categorically defined as full time (5) (\geq 31 h per week) and part time (5) ($<$ 30 h per week). Hours per week were calculated by multiplying hours per day and days per week for each child. Maternal BMI was also calculated with \geq 30 defined as obese and \geq 25 to $<$ 30 defined as overweight using CDC guidelines (7).

A second predictor of interest was time when childcare was started analyzed continuously and categorically with early access to care (defined as starting care at \leq 6 months of age) or

later access to care (defined as starting care at ≥ 3 years of age). Chi-square and *t*-tests were used to evaluate association between child weight category and hours of childcare in addition to timing of starting care. All data were analyzed using the STATA 11.0 software (StataCorp, College Station, TX, USA). All participants gave oral consent for their child's participation in the study. The study was approved by the Committee on Human Research, the Institutional Review Board, at the University of California, San Francisco.

Results

Maternal socio-demographics

We enrolled 201 Latina women in the cohort as previously described in Wojcicki *et al.* (6). The majority of our cohort (61.2% [123/201]) was of Mexican ethnicity; the remainder was primarily of Central American origin (El Salvadorian, Guatemalan and Honduran). We did not collect information on racial background on participants. Most women (71.0% [115/162]) were participants in the Women, Infants and Children's Program (WIC), and 71.6% (144/201) were unemployed. Our participants tended to have a high school diploma or less (76.0% [152/200]), and 93.0% (187/201) cited Spanish as the primarily language. The mean maternal BMI was 25.8 ± 5.5 (13.1–56.7).

The mean age when a child was first placed into childcare was 2.8 ± 1.0 (0.04–4) years (Table 1). More than half of the children were overweight (47.3%) or obese (24.9%) at age of 4 years; 11.4% (18/152) had a WC ≥ 90 th percentile and mean BMI Z score was 1.08 ± 1.20 . Seventy-one per cent of the parents (71.1% [135/190]) indicated that their child was in some form of childcare at age 4 (Table 1). A majority of the children (71.0% [98/138]) began childcare at or after the age of 3 years, while only 10.1% (14/138) began before or at 6 months of age (Table 1).

The mean hours per day spent in childcare were 6.4 ± 2.1 (2.5–12) h, averaging 4.8 ± 0.4 (3–5) d per week. The mean hours per week spent in childcare were 31.2 ± 11.3 (10–60) h. Almost all of the children were in a pre-school or childcare centre as opposed to receiving home-based care (98.5%) (Table 1).

Childhood overweight was not associated with attending childcare at 4 years of age (47.7 vs. 47.4%, $P = 0.98$) (Table 1) or childhood obesity and attending childcare (29.0 vs. 24.2%; $P = 0.56$; results not shown). Similarly, attending full-time child-care was not associated with overweight (44.3 vs. 55.7%; $P = 0.57$, Table 1) or obesity (44.3 vs. 50.0%; $P = 0.52$) in comparison with part-time childcare. The mean age that childcare began for children who were overweight was 2.8 ± 0.1 years vs. 2.9 ± 0.1 years (0.04–4) for normal-weight children. More than half (55.6%) of the children who were overweight began care at a young age (< 6 months) vs. 44.4% of children who were normal weight ($P = 0.61$) (Table 1). Similarly, of the children who were obese, 22.2% ($P = 0.96$) began care when they were < 6 months of age, similar to the 23.0% of children who were not obese ($P = 0.34$) (results not shown).

Additionally, BMI Z scores or having a WC 90th percentile did not differ based on childcare parameters, including being in care at 4 years of age, hours a week in childcare at 4 years, or age that childcare began (Table 2).

Discussion

In our population of Latino children born in San Francisco with parents originating from Mexico and Central America, we did not find any association between timing of childcare initiation or hours of childcare and risk for overweight or obesity at age 4.

In contrast, the study by Benjamin *et al.* (4) found an association in children in Project Viva who began care at 6 months of age or younger and an increased weight-for-length Z score at 1 year and BMI Z score at 3 years of age. Although the sample size of this study was much larger than ours ($n = 1138$), the population was quite different in socio-demographics and was almost exclusively White and African American with less than 5% being Hispanic. Furthermore, the majority of the sample was in a higher socioeconomic bracket ($> \$70\,000$ per year) and more than 50% had a college degree or graduate-level education. The socio-demographics of Project Viva contrasts sharply with our population where 76% had a high school diploma or less, 70.1% participated in the WIC, and 93.0% spoke Spanish as a primary language. In contrast with our analyses, this study evaluated the relationship between entry to care and BMI Z score and overweight/obesity at a slightly younger age (3 years) in contrast with our 4 years of age.

Pearce *et al.* (5) used the Millennium Cohort Study ($n = 14\,630$) to examine the data of children born in the United Kingdom. This population of children was almost exclusively White (86.8%) with the remainder being Black or Indian/Pakistani. The study found an association among children in informal childcare (defined as being cared for by a friend, neighbour, grandparent, or other relative, babysitter or unregistered child minder) and overweight and obesity at 3 years of age, particularly those in full-time care. Of additional interest, they found that the children of educated mothers (with an advanced diploma) were at greater risk for overweight and obesity at age 3 if they were in informal care in comparison to those children in formal care or cared for by parents. These same associations with obesity were not found in children of mothers with less education. Cultural differences in approach to childcare between the United Kingdom and the United States may also in part explain some of the differences in findings.

Our study had a few limitations. In our sample, more than half of the children were overweight or obese, resulting potentially in limited power to evaluate the impact of childcare status on obesity given the relatively equal division in size between small groups. Additionally, more than half of the children began care at 3 years of age or older creating potentially similar power issues. As older children (> 2 years) tend to be cared for in formal settings, such as childcare centres, and spend more hours per week in care than younger children, we did not have sufficient heterogeneity in our sample to evaluate the impact of childcare setting type or hours per week in relationship to weight outcomes in this sample of older pre-school children. Additionally, our study did not take into account the level of physical activity available at the childcare setting, nor the various other elements that impact

the type of care a child receives such as provision of healthy meals and snacks (10). Additionally, there is a possibility of recall bias among the participants due to mothers being surveyed retrospectively.

In contrast to previous studies, our study found no association between early entry to care (<6 months of age) or care or receiving childcare at 4 years of age and risk for overweight, obesity or increased BMI Z score in this low-income group of Latino children. It is possible that childcare exposures to, for instance, unhealthy foods could contrast more sharply with home exposures for children from high versus low socioeconomic settings. Thus, these exposures may impact weight gain and eating habits differently depending upon child's socioeconomic status. These factors require further systematic study.

With two-thirds of U.S. infants cared for by someone other than their parent and 74% of children 3–6 years of age in some form of non-parental care, future studies need to focus on the impact of early entry to care and hours in care on long-term child health (9). With pre-school-aged children consuming 50–100% of their recommended dietary allowances in childcare settings (9), there is a strong need for policy and program interventions addressing early childhood obesity to focus on the childcare environment (11). Additionally, having a clear grasp of child-care providers' knowledge and beliefs regarding their role in children's health could be an essential component of childcare-based obesity prevention initiatives that should also be explored in future studies (12). Cultural and socioeconomic factors that impact the structure of care should also be investigated.

Acknowledgements

This work is supported by NIH grants DK080825 (JMW) and DK060617 (MBH).

References

1. Ogden CL, Carroll MD, Kit BK, Flegal KM. Prevalence of obesity and trends in body mass index among US children and adolescents, 1999–2010. *JAMA*. 2012; 307:E1–E8.
2. Kim J, Peterson KE, Scanlon KS, et al. Trends in overweight from 1980 through 2001 among preschool-aged children enrolled in a health maintenance organization. *Obesity (Silver Spring)*. 2006; 14:1107–1112. [PubMed: 16899790]
3. Serdula MK, Ivery D, Coates RJ, Freedman DS, Williamson DF, Byers T. Do obese children become obese adults? A review of the literature. *Prev Med*. 1993; 22:167–177. [PubMed: 8483856]
4. Benjamin SE, Rifas-Shiman SL, Taveras EM, et al. Early child care and adiposity at ages 1 and 3 years. *Pediatrics*. 2009; 124:555–562. [PubMed: 19651579]
5. Pearce A, Li L, Abbas J, et al. Is childcare associated with the risk of overweight and obesity in the early years? Findings from the UK Millenium Cohort Study. *Int J Obes*. 2010; 34:1160–1168.
6. Wojcicki JM, Holbrook K, Lustig RH, Caughey AB, Muñoz RF, Heyman MB. Infant formula, tea and water supplementation of Latino infants at 4–6 weeks postpartum. *J Hum Lact*. 2011; 27:122–130. [PubMed: 21527796]
7. Centers for Disease Control and Prevention. [accessed 24 September 2011] Basics about childhood obesity. [WWW document]. URL <http://www.cdc.gov/obesity/childhood/basics.html>
8. Li C, Ford ES, Mokdad AH, Cook S. Recent trends in waist circumference and waist-height ratio among US children and adolescents. *Pediatrics*. 2006; 118:e1390–e1398. [PubMed: 17079540]
9. Benjamin SE, Craddock A, Walker EM, Slining M, Gillman MW. Obesity prevention in child care: a review of U.S. state regulations. *BMC Public Health*. 2008; 8:188. [PubMed: 18513424]

10. Ehrle Macomber J, Adams G, Tout K. Who's caring for our youngest children? Child care patterns of infants and toddlers. [WWW document]. URL <http://www.urban.org/publications/310029.html>.
11. Koleilat M, Harrison GG, Whaley S, McGregor S, Jenks E, Afifi A. Preschool enrollment is associated with lower odds of childhood obesity among WIC participants in LA County. *Matern Child Health J.* 2012; 16:706–712. [PubMed: 21431308]
12. Lanigan JD. The relationship between practices and child care providers. Beliefs related to child feeding and obesity prevention. *J Nutr Educ Behav.* 2012 Nov; 44(6):521–529. [PubMed: 22559927]

Table 1
 Childcare in Latino children and association with child overweight status (BMI 85th percentile)

Variable	$\bar{X} \pm SD$ (range) or % (n/total)	Child overweight (n = 80)	Child not overweight (n = 89)	P value*
		$\bar{X} \pm SD$ (range) or % (n/total)	$\bar{X} \pm SD$ (range) or % (n/total)	
Childcare				
In childcare at 4 years	71.1 (135/190)			
Hours per day of childcare at 4 years	6.4 ± 2.1 (2.5–12)			
No. of days per week in childcare at 4 years	4.8 ± 0.4 (3–5)			
Hours per week in childcare at 4 years	31.2 ± 11.3 (10–60)			
Age when childcare began, years	2.8 ± 1.0 (0.04–4)			
Formal childcare (pre-school or childcare centre)	98.5 (127/129)			
Childcare began at 6 months of age	10.1 (14/138)			
Childcare began at 12 months of age	13.8 (19/138)			
Childcare began at 3 years of age	71.0 (98/138)			
Child weight parameters at 4 years of age				
Overweight (BMI 85th percentile)	47.3 (80/169)	47.7 (61/128)	52.3 (67/128)	0.98
Obese (BMI 95th percentile)	24.9 (42/169)	47.4 (18/38)	52.6 (20/38)	
BMI Z score	1.08 ± 1.20	6.3 ± 0.3 (2.5–12)	6.5 ± 0.3 (2.5–12)	0.68
Waist circumference 90th percentile	11.8 (18/152)			
Childcare parameters in relationship to overweight, BMI 85th percentile				
In childcare at 4 years		47.7 (61/128)	52.3 (67/128)	0.98
Not in childcare at 4 years		47.4 (18/38)	52.6 (20/38)	
Hours per day in childcare		6.3 ± 0.3 (2.5–12)	6.5 ± 0.3 (2.5–12)	0.68
Hours per week in childcare		44.3 (31/70)	55.7 (39/70)	0.52
Full time (31 h)		50.0 (29/58)	50.0 (29/58)	
Part time (10–30 h)		2.8 ± 0.1 (0.04–4)	2.9 ± 0.1 (0.04–4)	0.82
Age when childcare began, years				
Childcare began at 6 months of age		55.6 (5/9)	44.4 (4/9)	
Yes				

Variable	$\bar{X} \pm SD$ (range) or % (n/total)	Child overweight	Child not overweight	P value*
		(n = 80)	(n = 89)	
		$\bar{X} \pm SD$ (range) or % (n/total)	$\bar{X} \pm SD$ (range) or % (n/total)	
No		45.9 (56/122)	54.1 (66/122)	
Childcare started at 1 year of age				
Yes		12.9 (9/15)	9.8 (6/15)	
No		47.4 (55/116)	52.6 (61/116)	
Childcare started at 3 years of age				
Yes		47.9 (46/96)	52.1 (50/96)	
No		42.9 (15/35)	57.1 (20/35)	

* P value was calculated using Student's *t*-test or chi-square test. BMI, body mass index; SD, standard deviation.

Table 2

Childcare parameters in relationship to BMI Z score at 4 years and waist circumference 90th percentile

Variable	Waist percentile 90th	<i>P</i> value*	BMI Z score	<i>P</i> value*
Childcare parameters				
In care at 4 years	10.3 (12/116)	0.4	0.97 ± 0.90	0.79
Not in care at 4 years	89.7 (104/116)		0.92 ± 1.37	
Hours per week in childcare				
Full time (≥ 31 h)	46.2 (6/13)	0.3	0.98 ± -1.11	0.33
Part time (10–30 h)	53.9 (63/104)		1.16 ± 0.96	
Childcare began at 6 months of age				
Yes	0.0 (0/8)	0.3	1.39 ± -1.32	0.37
No	100 (8/8)		1.06 ± 1.00	
Childcare began at 12 months of age				
Yes	7.7 (1/13)	0.6	0.89 ± -0.90	0.46
No	92.3 (12/13)		0.11 ± -1.10	
Childcare started at 3 years of age				
Yes	11.4 (10/88)	0.8	1.11 ± -1.08	0.66
No	88.6 (78/88)		1.01 ± -1.06	

* *P* value was calculated using Student's *t*-tests or chi-square tests of association.

BMI, body mass index.