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 JOURNAL OF
**ADOLESCENT
 HEALTH**

www.jahonline.org

Original article

Lunchtime School Water Availability and Water Consumption Among California Adolescents



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Article history: Received March 28, 2015; Accepted September 1, 2015

Keywords: Adolescent health; Obesity prevention; Water

A B S T R A C T

Purpose: To examine the potential impact of California SB 1413, which required school districts to provide free, fresh drinking water during mealtimes in food service areas by July 1, 2011, on greater water consumption among California adolescents.

Methods: Data were drawn from the 2012 and 2013 state-representative California Health Interview Survey. A total of 2,665 adolescents aged 12–17 years were interviewed regarding their water consumption and availability of free water during lunchtime at their school.

Results: Three-fourths reported that their school provided free water at lunchtime, mainly via fountains. In a multivariate model that controlled for age, gender, income, race/ethnicity, body mass index, and school type, adolescents in schools that provided free water consumed significantly more water than adolescents who reported that water was not available, bivariate (standard error) = .67 (.28), $p = .02$. School water access did not significantly vary across the 2 years.

Conclusions: Lunchtime school water availability was related to water consumption, but a quarter of adolescents reported that their school did not provide free water at lunch. Future research should explore what supports and inducements might facilitate provision of drinking water during school mealtimes.

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IMPLICATIONS AND CONTRIBUTION

To help prevent obesity and promote health, California SB 1413 requires school districts to provide free drinking water at mealtimes in food service areas. We examined SB 1413's potential impact, finding that lunchtime school water availability was related to adolescents' water consumption in the 2012 and 2013 California Health Interview Survey.

In the United States, about 17% of adolescents are obese and about a third are overweight [1,2]. To help curb obesity rates, policymakers have enacted federal and state legislation about the school food and beverage environment. In accordance with 2007 Institute of Medicine recommendations [3], California state-specific legislation (SB 1413) [4] and the Healthy Hunger-Free Kids Act

(S.3307) [5] require availability and provision of water at schools. Water, which is noncaloric, may displace less healthy, caloric beverages and is associated with reduced dental caries and improved cognitive functioning in children [6–12]. Moreover, an analysis of a representative US sample suggests that over half of youth aged 6–19 years are not adequately hydrated [13].

Experimental and quasi-experimental studies of increased water provision in schools through nonfountain sources, as well as by supplying drinking cups near water sources, have shown that improved water availability and promotion can result in increased student water consumption [14–17]. Moreover, in a

Conflicts of Interest: There are no conflicts of interest to disclose.

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representative sample of California school administrators, 75% reported that their schools provided free drinking water in food service areas in 2011 (and this percentage increased from pre-implementation to postimplementation of SB 1413, from 72% to 83%) [18]. However, no previous studies have examined these issues in a large population-based sample of adolescents.

In the present research, we examined adolescents' perceptions of water access at lunchtime in California schools over time (in 2012 and 2013), since the passage of California SB 1413, which required school districts to provide free, fresh drinking water during mealtimes in school food service areas by July 1, 2011. We also examined whether perceptions of water access in schools during lunchtime were associated with adolescents' water consumption. Based on the prior research reviewed previously, we hypothesized that greater school water access during lunchtime would be associated with greater water consumption overall.

We also explored the association between lunchtime water availability and milk consumption. Milk consumption in adolescence can be beneficial for increasing bone mineral density, especially among girls [19]. Thus, some school stakeholders have been concerned about potential negative effects of water availability on milk consumption. However, research has suggested that milk consumption may be relatively stable even when water is provided in school food areas [16]. Thus, we did not make firm a hypothesis about the expected direction of the effect.

Because adolescents are in a developmental period in which they are beginning to make independent choices about diet, gaining autonomy from their parents and being more influenced by their peers at school, we chose to focus this study on adolescents [20–22]. We used data from the state-representative California Health Interview Survey (CHIS), which interviews adolescents aged 12–17 years annually.

Methods

Participants

The present analysis used data from the 2012 and 2013 CHIS, a population-based telephone survey with a multistage sampling design that is representative of the California noninstitutionalized population. Detailed information about CHIS methodology is available elsewhere [23–27]. A total of 20,355 adults and 1,464 adolescents aged 12–17 years provided data in CHIS 2012, and 20,724 adults and 1,201 adolescents provided data in CHIS 2013.

One randomly selected adult (aged 18 years or older) was interviewed in each household after providing informed consent. If the household contained adolescents aged 12–17 years, one randomly selected adolescent was interviewed as well, on obtaining parental permission and assent from the adolescent. In 2012, 59.6% of the randomly selected adolescents were given parental permission to participate in the interview and 66.5% of them completed the interview. In 2013, these rates were 59.3% and 71.3%, respectively. Interviews were conducted in English, Cantonese, Korean, Mandarin, Spanish, and Vietnamese.

Measures

School lunchtime water availability. Adolescents were asked items constructed for the present study to assess water availability in schools during lunchtime; these items were monitored closely by interviewers for comprehension issues during the first few months of data collection, and no issues were identified.

Adolescents were first asked, "Does your school offer free drinking water to students during lunchtime?" If the adolescent asked what "free" meant, the interviewer clarified, "By free, I mean water that you don't have to pay for."

Adolescents who indicated that their school offered free drinking water to students at lunch were further asked questions about the different sources of free water in their schools, including: drinking fountains or faucets; water pitchers; a water cooler, such as a large container of water with a spout; and free bottled water. For example, adolescents were asked, "Does your school offer free drinking water to students at lunchtime from drinking fountains or faucets in the cafeteria or where students eat?" Adolescents who indicated that their school offered free drinking water to students at lunch were also asked, "Does your school give out free cups for drinking water during lunchtime?" (Students in schools that gave out free bottled water were not asked about cups because it was assumed that such students would not need to pour the water from the bottle into the cup. In addition, students were only asked about water availability at lunch, and not breakfast, which is also covered by California SB 1413.)

Water and milk consumption. Adolescents were asked, "Yesterday, how many glasses of water did you drink at school, home, and everywhere else? Count one cup as one glass and count one bottle of water as two glasses. Count only a few sips, like from a water fountain, as less than one glass. Your best guess is fine." If needed, the interviewer clarified by saying, "Include tap water, like from a sink, faucet, fountain, or pitcher, and bottled water like Aquafina. Do not include flavored sweetened water." If the adolescent was not in school the day before the interview, he/she was instead asked about "the last day that you were in school." This item was drawn from a prior California school-based study [28]. One item was used to assess milk consumption: "Yesterday, how many glasses of nonfat or low-fat milk did you drink? Do not include 2% milk or whole milk." Responses to both items were considered continuously (as number of glasses of water or milk reported); responses of less than a glass of water were coded as .5 glasses.

Covariates: sociodemographic characteristics, body mass index, and school type. Sociodemographic characteristics included age, gender, and race/ethnicity, which were reported by adolescents and household income, which was reported by parents. Race categories were listed as: white, black or African American, Asian, American Indian or Alaska native, other Pacific Islander, Native Hawaiian, and other; participants were asked about Latino or Hispanic ethnicity in a separate question. Household income responses were categorized into 0%–99% of federal poverty level (FPL), 100%–199% of FPL, 200%–299% of FPL, and ≥300% of FPL. Adolescents reported their height and weight, from which body mass index (BMI) was calculated and classified as underweight (BMI <fifth percentile), normal weight (BMI ≤fifth but <85th percentile), overweight (BMI ≥85th percentile and <95th percentile), or obese (BMI ≥95th percentile) [29]. Adolescents also reported the type of school that they attended (elementary, middle, or high school, or not in school).

Analyses

We examined descriptive statistics for sociodemographic characteristics by each year separately, as well as for the combined 2012/2013 sample. We also examined the percentages of

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