

# Exploring Nutrition Education Resources and Barriers, and Nutrition Knowledge in Teachers in California

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## ABSTRACT

**Objective:** To determine barriers to nutrition education, nutrition education resources used, and the relationship between nutrition knowledge and whether public school teachers in California teach nutrition in the classroom.

**Methods:** A total of 102 teachers in California participated in a Web-based survey about nutrition education barriers, resources used to plan nutrition lessons, and factors that would encourage inclusion of nutrition. A validated questionnaire was used to assess nutrition knowledge. Analyses included ordinary least-squares regression.

**Results:** Common barriers were lack of instructional time and unrelated subject. Teachers were unaware of many nutrition education resources. Nutrition knowledge was not associated with nutrition lessons but was positively associated with teaching high school ( $\beta = 5.13$ ;  $P < .05$ ) and female gender ( $\beta = 6.78$ ;  $P < .05$ ), and negatively associated with identifying as Hispanic or Latino ( $\beta = -15.50$ ;  $P < .001$ ).

**Conclusions and Implications:** Barriers of time and lack of unrelated subject matter are difficult to address but lack of awareness of resources indicates that promotion of existing resources may encourage teachers to provide nutrition education. Larger studies are needed to determine whether this holds true in a broader sample.

**Key Words:** nutrition knowledge, nutrition education, school nutrition, teachers (*J Nutr Educ Behav.* 2015;47:162-169.)

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## INTRODUCTION

With the rise in childhood obesity over the past few decades, schools have emerged as a primary target for interventions designed to slow or reverse this troubling trend.<sup>1-3</sup> Schools have been viewed as an ideal setting, in part because of the captive audience; children spend the majority of their waking hours in the classroom. The Institute of Medicine<sup>3</sup> recommended that schools be a focal point for obesity prevention, with sequential food literacy and nutrition science education as a key strategy. Expansion of nutrition education will require support from teachers because many will be tasked with providing it. However, teachers face many barriers to the inclusion of nutrition education that will need to

be addressed to meet the goal of sequential nutrition education. According to the Social Ecological Model, there are several spheres of influence on behavior.<sup>4</sup> When it comes to teaching nutrition in the classroom, intrapersonal factors such as knowledge or beliefs about nutrition may be important determinants in whether nutrition is taught. Lack of nutrition knowledge and feeling unprepared to teach nutrition have been reported to be barriers to providing nutrition education, yet relatively few studies have examined relationships between nutrition knowledge and classroom nutrition education. Previous studies suggested that nutrition knowledge of teachers is positively associated with teaching nutrition and self-efficacy to teach nutrition, and that nutrition-related

professional development increases nutrition knowledge.<sup>5-8</sup> However, there are gaps in the literature with regard to factors that may be associated with nutrition knowledge of teachers. Determining factors associated with nutrition knowledge in teachers may be helpful in tailoring nutrition education inservices and professional development to meet the needs of teachers. Resources used by teachers to plan lessons are another factor that may also be useful in designing nutrition professional development, by identifying possible gaps in awareness of available resources. Research in this area is limited; only a few studies have examined resources used by teachers to plan nutrition lessons. Those that assessed resources focused on individual school districts<sup>9,10</sup> or are more than a decade old and may not reflect recent trends.<sup>11</sup> The hypothesis of this study is that nutrition knowledge predicts teaching nutrition. The study had 3 main purposes: to determine barriers to nutrition education; to determine the nutrition education resources used by teachers; and to determine whether there is a relationship between

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nutrition knowledge, whether nutrition is taught in the classroom, and to identify demographic, classroom, and school factors in a sample of public school teachers in California.

## METHODS

### Sample

The researchers selected a random sample of 24 school districts out of the 1,043 districts in California using the California Department of Education online database. District superintendents were contacted to request permission to contact schools and teachers about the study. In districts where there were  $\leq 5$  schools, all schools were contacted. In districts with  $> 5$  schools, the authors randomly selected 5 schools to be contacted. Permission to contact teachers in their school was requested of principals through e-mail and phone calls. With the exception of districts in which the superintendent elected to forward study e-mails, if the authors did not receive permission from the principals, they did not contact teachers at those schools. Participation was solicited from all teachers at the schools, pre-kindergarten through 12th grade. There was no incentive offered to districts, schools, or teachers to participate in the survey.

### Procedures

The questionnaire used in the survey contained questions about school and classroom information (including grade levels taught, subjects taught, hours of nutrition taught, and whether an instructional school garden was present), nutrition knowledge, and demographic information. The knowledge questionnaire was evaluated for internal consistency, construct validity, and test-retest reliability, as previously described,<sup>12</sup> and nutrition experts at University of California, Davis, reviewed additional questionnaire sections for content validity. In addition, the questionnaire asked about sources of personally used nutrition information and attitudes toward nutrition and nutrition information; however, results from this section of the questionnaire are not discussed here. To reduce respondent burden and minimize irrelevant questions, the

researchers used skip logic to direct participants along question pathways based on responses provided to earlier questions; different questions were asked depending on the question pathway. A Web-based survey methodology using SurveyMonkey Gold (SurveyMonkey.com, LLC, Palo Alto, CA) was conducted between February and April, 2013. The tailored design method of Dillman et al<sup>13</sup> was followed. Teachers received an initial e-mail to inform them about the study and invite participation. One week later, an e-mail with a link to the Web-based questionnaire was sent. After another week had passed, a third e-mail was sent to serve as a thank-you to those who had completed the survey and a reminder to those who had not. Two weeks later, a final reminder e-mail was sent.

This study was reviewed by the University of California, Davis Institutional Review Board and was approved as an exempt study.

### Data Analysis

Data were downloaded from the Web-based survey software as an SPSS data file and the authors used SPSS 21 for all analyses (IBM, Inc, Armonk, NY, 2012). The number of responses for each question varied owing to skip logic and incomplete questionnaires. Unless otherwise specified, data reported are calculated using all responses to individual questions, with the total number of responses specified. Ordinary least-squares (OLS) regression analyses were conducted to evaluate the relationship between nutrition knowledge score, whether nutrition education was taught in the classroom, other classroom and school-level variables (subjects taught, grade grouping taught, and whether nutrition was taught by another teacher), and demographic information. Participants were allowed to select  $> 1$  response for subjects taught and race and ethnicity; all responses were included in the model. Only respondents who completed at least 50% of the knowledge questions were included in the nutrition knowledge analyses, and percent correct was calculated based on the number of questions on the measure. Only cases that had data for all variables were included in the regression analysis. Variables that were nonsignificant or

explained  $< 5\%$  of the variance in nutrition knowledge score were removed from the model. Outliers with studentized residuals of  $\geq 2$  were removed from the analysis.<sup>14</sup>

## RESULTS

Of the 24 districts contacted, 8 superintendents agreed to allow district participation in the study. Two superintendents declined their district's participation and 9 districts did not respond to e-mail or phone requests; there was a lack of follow-up with 5 districts. Three districts had  $> 5$  schools; 5 schools from these districts were randomly chosen. Of the 31 schools eligible to participate, the authors received permission to contact teachers at 20 schools in 8 districts. Responses were received from teachers in 6 districts and 16 schools. Based on the number of teachers at participating schools, approximately 450 teachers were contacted. However, a few superintendents and principals elected to forward study e-mails to teachers rather than allow study personnel to e-mail teachers directly, which may have resulted in fewer teachers being contacted than intended. Furthermore, spam filters may have prevented study e-mails from reaching teachers. When only teachers at schools with survey respondents are counted, the number of teachers contacted was approximately 380. All participating districts with survey respondents were located in northern or central California and had enrollments of  $< 4,000$  students. Total response frequencies for each question varied; the maximum number of respondents was 102, yielding a response rate of 23% to 27%. The total number of respondents is reported in data tables with each question. Table 1 lists demographic and classroom characteristics of participants. When asked, "Do you teach nutrition lessons in your classroom?" 37% indicated they taught nutrition lessons (Table 1). Of those who taught nutrition, the most common response was 3–5 hours/semester.

### Nutrition Education Barriers and Resources

Among those who did not teach nutrition, the most common barrier was

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