Published in final edited form as:

J Sch Health. 2012 June ; 82(6): 294–300. doi:10.1111/j.1746-1561.2012.00700.x.

School-based BMI and Body Composition Screening and Parent Notification in California: Methods and Messages

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Abstract

BACKGROUND—School-based body mass index (BMI) or body composition screening is increasing, but little is known about the process of parent notification. Since 2001, California has required annual screening of body composition via the FITNESSGRAM, with optional notification. This study sought to identify the prevalence of parental notification when screening is required but notification is optional, and the methods and messages used.

METHODS—Researchers conducted phone interviews with 851 school districts (89%) in California and reviewed notification materials from 54 districts.

RESULTS—As of 2008, 53% of California districts notified parents of screening results. Many districts (24%) did not know the reason for their notification policy. Most districts notified parents via a letter mailed home (70%) or sent home with the child (18%). Whereas 79% of sample letters provided students' BMI, only 12% provided an explanation of BMI, and only half provided tips on what parents should do if concerned about their child's results.

CONCLUSIONS—In California, where body composition screening is required but parent notification is not, approximately half of school districts elect to notify parents of results, most commonly via letter. Most letters do not explain BMI or percent body fat scores, nor do they suggest what parents should do for a child identified as at-risk. Further research to identify interpretable and actionable notification messages for parents will be critical if school-based BMI and body composition screening and notification is to reduce childhood obesity.

Keywords

School health; Body Mass Index; Screening; Adolescent; Health Policy

Pediatric obesity in the United States remains a major public health concern.^{1, 2} An Institute of Medicine (IOM) report recommended school-based body mass index (BMI) screening to address childhood obesity, asserting that “schools should measure yearly each student’s [BMI] and make this information available to parents and to the student (when age appropriate).”³ As of 2010, 20 states require BMI or body composition screening and 6 states recommend screening, either alone or as part of a comprehensive fitness assessment.⁴

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Human Subjects Approval Statement

The University of California San Francisco’s Committee on Human Research certified this study as exempt.

Among states requiring BMI or body composition screening, fewer than half require parent notification of test results,⁴ and prevalence of notification is unknown in these states. Yet, notification serves as the major mechanism by which BMI screening is expected to impact obesity: it is theorized that increasing parents' awareness of their child's risk will compel them to take steps towards improving their child's health.^{5, 6} In addition to uncertainty about notification rates, little is known about methods used when school districts elect to notify parents. The FITNESSGRAM®,⁷ a battery of 6 fitness assessments that evaluate body composition (BMI, skinfolds, or bioelectrical impedance), aerobic capacity, flexibility, and strength and endurance, is required or recommended in at least 16 states⁴ and may be the vehicle for BMI or body composition screening and notification in many school districts (in California, 95% of schools use BMI to assess body composition for the FITNESSGRAM, personal communication from the California Department of Education [CDE]). A recent study of BMI screening and notification via FITNESSGRAM assessments did not demonstrate improvements in pediatric obesity at the population level;⁸ therefore, a better understanding of current notification methods will be critical in informing school-based efforts to reduce obesity.

In California, annual FITNESSGRAM assessments have been required for 5th, 7th, and 9th grade students since 2001;⁹ however, parent notification has been optional. California's policy affords the opportunity to collect meaningful data on the practice of BMI and body composition notification in the most populous state. Therefore, this study sought to examine the prevalence of and reasons for notification among school districts when notification is optional, the methods by which notification occurs, and the content and quality of notification messages.

METHODS

Participants

This cross-sectional study involved phone interviews attempted in 2008 and 2009 to 892 school districts across California: 438 K-8 districts, 379 K-12 districts, and a random sample of 40 9–12 districts and 35 K-6 districts.

Instruments

Researchers used a structured interview script during phone calls to districts to determine if districts notified parents of child FITNESSGRAM test results, and if so, when notification began, and why and how the district notified parents.

Procedure

Two researchers made phone calls to districts using the structured interview script. Prior to calling districts, researchers participated in half-day training of how to conduct phone interviews.

Researchers called each school district's main line and asked to speak to the person most knowledgeable about FITNESSGRAM testing procedures. Once contacted, this individual either confirmed that she/he was the most appropriate contact or recommended another, more knowledgeable individual. Researchers first asked contacts if their district notified parents of child FITNESSGRAM test results. Districts notifying parents of FITNESSGRAM results were asked to provide a sample results letter. Publicly available data were obtained directly from the CDE's website¹⁰ on district demographics: percent of students eligible for free or reduced-price meals; enrollment; percent Caucasian students; and urbanicity (the California Department of Education [CDE] uses Census Bureau data to classify each district on an 8-point scale ranging from a city with population > 250,000 to a rural area). In 2007–

08, California had 61 K-6, 438 K-8, 370 K-12, and 78 9–12 districts, with a median enrollment of 1781 students (inter-quartile range: 374 to 6033).

Sample notification materials—The CDE guide for new administrators of the FITNESSGRAM lists 4 vendors that can provide letters with individual student's results.¹¹ Districts may also purchase software from Human Kinetics (Champaign, IL) or other vendors to create custom letters with each student's results. Researchers called each of the 4 vendors listed in the CDE guide to ask how many school districts they served.

Two researchers independently coded sample notification letters provided by school districts to determine if the letter: (1) included a body composition score (BMI or percent body fat); (2) gave an explanation for body composition (eg, "BMI provides an indication of a student's weight relative to his or her height"); (3) provided a range of healthy/unhealthy values for body composition; (4) provided a "rating" of the student's body composition score (eg, "Needs Improvement" or "Pass" or "Good"); (5) contained tips related to nutrition or physical activity; and (6) suggested contacting the student's health care provider if a child's scores were concerning. Inter-rater reliability for each item (Kappa) was > 0.91 .

Data Analysis

Chi-squared tests (or Fisher's exact test for cells < 5) determined if district type (K-6, K-8, K-12 or 9–12) or urbanicity was associated with: responding to interview requests; notifying parents of fitness test results; method of notification (sending a letter via mail versus other method); or providing a sample letter. Logistic regression determined if continuous indicators of district demographics predicted the same outcomes. All analyses were performed in Stata/MP 11.1 (StataCorp, College Station, TX).

RESULTS

Telephone interviews were completed with 429 K-8 (98%), 358 K-12 (94%), 30 9–12 (38% of total; 75% of those randomly selected) and 34 K-6 (56% of total; 97% of those randomly selected) school districts. Whereas 9–12 districts were less likely to respond to interview requests than other districts ($p < .001$), there were no differences in district demographics between responders and non-responders ($p > .10$ for all analyses). Interviewees' job titles were: Assessment Specialist (30%), Administrative Assistant (27%), PE teacher or Athletic Director (14%), Superintendent or Assistant Superintendent (12%), and Principal or Teacher (10%); 8% were outside these categories.

Fifty-three percent of school districts reported notifying parents of student's fitness test results in 2008, while 34% reported that they had notified in 2001. In 2001, 9–12 districts were significantly less likely to notify than other districts (14% vs. 35% on average, $p = .026$), but by 2008 there were no differences in notification status by district type. District demographics did not predict notification in either 2001 or 2008.

How Districts Notify

The majority of the 448 districts that notified parents in 2008 sent a letter home, either via the US postal service (70%) or with the child (18%). Less frequent methods of notification included in-person discussion at parent-teacher conferences (6%), and inclusion of results with classroom grades or academic standardized test scores (1%). K-6 districts were more likely to send a letter home with the child than other districts (45% vs. 17%, $p = .013$); otherwise, methods of notification were similar across district type. Method of notification was not associated with district demographics.

Why Districts Do or Do Not Notify

The reasons districts gave for notifying or not notifying are provided in Table 1. Superintendents were more likely to report not knowing why a district notified (40% vs. 26%, $p = .041$); Superintendents and PE teachers cited the importance of child health more than other respondents (35% vs. 19%, $p = .015$); and Administrative Assistants were more likely to report notification was required by law (31% vs. 19%, $p = .012$). (The law in California does not require parent notification, only fitness assessment.⁹) Of districts that did not notify, only 8% gave cost or lack of staff as the reason for not notifying and 9% reported having too few students to merit notification. Administrative Assistants were more likely to report not knowing the reason for not notifying (19% vs. 11%, $p = .031$) and Assessment Specialists were more likely to report that districts left notification decision up to individual schools (42% vs 16%, $p < .001$).

Sample Notification Letters

Of 335 districts that notified parents of results via a letter, 100 districts agreed to provide a sample of their results letter, and notification materials were ultimately received from 54 districts (22 from K-12, 21 from K-8, 9 from 9–12, and 2 from K-6 districts) after up to 2 follow-up phone calls. Thirty-three districts provided student-level results letters and 21 districts provided cover letters or handouts that accompany the student-level results letter (but not the letter itself). Whereas 9–12 grade districts were more likely to provide a sample letter than other district types (56% vs. 25% of those that notified, $p = .016$), no differences were found in district demographics between districts that did and did not provide a letter. Many districts declined to provide letters or provided only cover letters out of concern for student confidentiality.

Table 2 illustrates the content of the notification letters. All but 2 of the 33 results letters provided either the student's BMI ($N=25$) or percent body fat ($N=5$) or both ($N=1$). Two sample letters without a measure of body composition included all 5 other fitness assessments.

Letters from 10 districts were generated by a vendor listed in the CDE guide,¹¹ all of which provided the student's score in all 6 fitness assessments, uniformly listing BMI under a Body Composition heading. Figure 1 provides a composite representation of these letters. For each fitness assessment, letters included the range of healthy values (based on the Cooper Institute's criterion-referenced Healthy Fitness Zone^{®7}) and the score's rating (eg, "Needs Improvement" or "Pass" or "Good"). None of the standard vendor letters provided an explanation for BMI, although one vendor's letter denoted BMI as "Height/Weight (body mass index)," under the Body Composition heading. One vendor's letter closed with: "If all of your child's scores were within or above the Healthy Fitness Zone, congratulations." Phone calls to the 4 vendors listed in the CDE guide suggest that over 400 districts contract with one of these vendors for student-level results letter (not all of those districts necessarily send the letters home to parents).

Eight districts used FITNESSGRAM software to generate student letters, which were similar in layout to Figure 1; however, students' scores were displayed pictorially against a range of healthy values as in Figure 2 (example of Body Composition section). Under the Body Composition heading, 4 of the 8 letters provided BMI scores and 4 provided percent body fat. Only 1 of the 8 FITNESSGRAM letters explained BMI ("another indicator that determines if a person is at a healthy weight for his or her height").

Seven districts issued the standard text letter depicted in Figure 3. None of these letters explained BMI, although 2 included a rating for the student's score.

The final 8 letters were uniquely arranged: 3 provided both a range of healthy values and a rating with the child's BMI score, 2 provided either the range or the rating, and 3 provided neither a range or rating for scores (1 of which did not provide a body composition score). Three of the 8 letters provided an explanation of BMI (eg, "a screening test that tells if a person is overweight, at risk of overweight, a healthy weight, or underweight") or body composition (eg, "body composition test results provide an estimation of the percent of a student's weight that is fat in contrast to lean body mass").

Vendor notification letters did not provide any tips on physical activity or nutrition, though 3 districts using vendor letters included tips in supplemental material. All FITNESSGRAM letters provided tips related to physical activity such as "Try to play active games, sports, or other activities you enjoy a total of 60 minutes each day," and all 7 standard text letters suggested that parents encourage their child's regular participation in physical activity. Four FITNESSGRAM letters also included the general nutrition advice "eat a healthy diet," as did one unique letter. One additional district provided a handout explaining how to read a nutrition label. One district letter recommended that parents share their child's BMI score with a health care provider, but did not provide nutrition or physical activity tips.

Review of materials from the 20 districts providing cover letters or handouts (not the results letter itself) revealed that supplemental material from only 3 of 20 districts (18%) included an explanation of BMI. All 3 districts sent parents a 3-page Parent and Guardian Guide to the Physical Fitness Test (available from the CDE¹²), page 2 of which described each of the three options for body composition (Skinfold Measurements, Bioelectric Impedance Analyzer, and BMI) with the lead-in: "The three body composition options estimate the level of fat in the body. This is a key component of fitness because excessive fat content has been associated with health problems, such as coronary heart disease, stroke, and diabetes." The description for BMI reads: "To calculate the BMI, a student's weight and height measurements are inserted into a formula to produce an index of the relationship between weight and height."

DISCUSSION

As of 2010, 40% of states required BMI or body composition screening in schools either alone or as part of a comprehensive fitness assessment.⁴ The present study demonstrates that in California, where screening is required but notification is optional, about half of districts elect to notify parents of screening results. Consequently, any potential costs or benefits derived from notification will be limited to those districts that elect to notify. Overall, district responses suggest that the issue of parent notification does not receive much consideration in most districts. Interviewees in almost a third of school districts that notified parents did not know why their district did so. Many district personnel interpreted parent notification as being required by the state, when in fact only student notification, either orally or in writing, is required. Among districts not notifying, many left the decision up to individual schools, and almost one fourth did not know their reason or noted it was not a priority area. Against the backdrop of schools' myriad academic responsibilities, including addressing requirements of the No Child Left Behind Act of 2001,¹³ notifying parents of BMI screening results gets lost in the shuffle.

Whereas BMI screening and notification is becoming more widespread, one study suggests that notification in its current form in California does not reduce pediatric obesity.⁸ This constitutes a significant concern because findings from California, home to 13% of America's youth,¹⁴ likely extend to many states with similar fitness assessment policies. California, like the majority of states using a standardized tool,⁴ assesses body composition as part of the FITNESSGRAM, and many districts notify parents of results using letters

from national vendors. Thus, the lack of effect on obesity seen in California may extend to other states using similar notification methods. The FITNESSGRAM was developed as an overall fitness assessment – not as a tool for identifying obese youth. Consequently, notification letters are not designed to specifically highlight BMI or percent body fat; rather, these scores appear among several fitness results. This approach takes into account the critical importance of cardio-respiratory fitness in reducing cardiovascular risk.¹⁵ However, the impact of providing weight-status results alone versus providing weight status with other fitness results as a means of addressing pediatric obesity should be explored.

For notification letters to have their intended effect, parents must understand the information provided. Our results suggest that many districts notifying parents use a vendor letter to do so, yet none of these letters explain BMI or body fat, nor do any of the standard text letters. Body composition in general and BMI in particular are not well understood by parents,¹⁶ and letters may be difficult for parents to interpret. For example, parents of a child with a BMI above the recommended range maybe confused to learn that their child's BMI score "needs improvement" when falling *above* the healthy zone (Figure 3), a desirable placement for all other tests. Past studies examining the potential of notification letters to change parents' perceptions of their child's weight status have had mixed results,^{17–19} which could reflect the use of different notification messaging. Arkansas, a state with significant BMI notification experience,²⁰ uses a pictorial representation of a child's weight status²¹ similar to letters produced by the FITNESSGRAM software (Figure 2), which might be more easily interpreted by parents. In the clinical setting, color-coding of BMI has been shown to improve parental understanding of BMI.¹⁶ Message language, format, and content should undergo further testing, particularly examining the impact of various messaging in communities of different cultural and language backgrounds.²²

Even if parents understand messages in notification letters, they must also receive guidance regarding how to respond. Whereas CDC guidelines regarding BMI screening and notification recommend that parents share their child's results with a medical provider,²³ no vendor letters suggested sharing results with a primary care provider, nor did vendor letters provide tips related to nutrition and physical activity. Although some non-vendor notification letters did provide tips, most tips were general in nature and unlikely to provide parents with novel information. It is, therefore, difficult to imagine that such suggestions strongly influence parental action. One avenue for future research is the potential impact of simple messages, such as reducing or eliminating sugar-sweetened beverage consumption, that could effect positive change.²⁴ Additionally, it would be interesting to test messages that promote parent advocacy to change the environment in schools and the community, a more likely means of improving population health than messages targeting individuals' behaviors.²⁵ In the immediate future, these results are a call to action for schools, vendors, and Departments of Education to reconsider the language used in their current letters to ensure it is comprehensible and provides parents with appropriate steps to take.

When considering the potential reach of school-based BMI screening and notification, it is important to keep in mind that even a well-designed letter, whether in a child's backpack or in the mail, may be missed by parents. Among parents who had consented to participate in a study regarding BMI screening and reporting via a health report card, only half of parents acknowledged receipt of the report card 1 to 6 weeks later.¹⁷ In addition to letter content, future investigations might examine the most effective method of reaching parents.

Limitations

This cross-sectional study has several limitations. Study results represent practices occurring in California and may not generalize to others states. States collecting BMI data by methods other than the FITNESSGRAM may generate letters of a very different format. Although

each district interviewee confirmed her/his expertise in FITNESSGRAM practices, researchers had no way of assessing the accuracy of responses. Additionally, estimates of notification prevalence might have been artificially high due to social desirability bias; interviewees might have responded differently if asked specifically about notification of BMI or body composition screening results. Out of concern for student confidentiality, few districts provided a sample of their notification letter, making it difficult to estimate with precision the proportion of districts using each type of letter (and predictors of using various letters) and raising the possibility that researchers missed a commonly used letter type. Districts that provided letters, however, possessed similar demographics to those that did not, and given the similar information contained in the sample letters provided, it is unlikely that a large number of districts use a letter significantly more compelling than those described in this study. Districts may not have provided all the supplemental materials they send to parents, which could underestimate the proportion of parents receiving an explanation of body composition, or additional tips. Finally, the present study did not systematically assess availability of letters in different languages, though sample letters were received in Spanish, Chinese, Vietnamese and Hmong (data not shown).

Conclusion

BMI screening and notification is an intervention with a very broad reach but minimal dose, and could be one step among many that leads to improvements in childhood obesity. More work is needed to identify effective methods of notification. If effective messages are identified, further research should examine how to increase the number of districts notifying. In the meantime, resources may be better used to change the nutrition and physical activity environments in schools.

IMPLICATIONS FOR SCHOOL HEALTH

School-based BMI screening and subsequent parent notification may be an important tool in the fight against childhood obesity. The present study, however, suggests that current methods of notification in California do not convey BMI and body composition information to parents with appropriate context or offer steps parents can take to address their child's risk when screening results are not favorable. To increase the likelihood that parent notification of fitness test results will improve child health, districts or schools that choose to notify should carefully evaluate their notification methods, to ensure that results are readily understood by parents. When possible, notification letters should suggest school or community resources for parents with a child whose weight status is concerning, such as consultation with a school nurse, referral to community nutrition and physical activity programs, referral to the primary care provider, or links to local or national websites dedicated to reducing childhood obesity. Until notification methods improve, educational agencies are likely to see greater benefits to child health through implementation of policies that increase opportunities for physical activity and healthy nutrition during and after school.

Acknowledgments

RWJF Active Living Research Grant 65715, NICHD 1K23HD054470-01A1, and American Heart Association 0865005F. No funders were involved in any aspect of the analyses contained herein or in the preparation of this manuscript.

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CALIFORNIA PHYSICAL FITNESS TEST INDIVIDUAL STUDENT REPORT

	Test	Student Score	Healthy Fitness Zone [®]	Student's Performance
Aerobic Capacity	Mile Run (min:sec)	13:05	12:00 – 9:00	Needs Improvement
	Sit-ups	05	15 - 29	Needs Improvement
Muscle Strength, Endurance and Flexibility	Trunk lift (inches)	14	9 - 12	Within or Above the Healthy Fitness Zone [®]
	Push Ups	07	7 - 15	Within or Above the Healthy Fitness Zone [®]
	Sit and Reach (inches)	30	25 - 36	Within or Above the Healthy Fitness Zone [®]
Body Composition	Body Mass Index	25.2	24 – 14.0	Needs Improvement

Healthy Fitness Zone[®] is a registered trademark of the Cooper Institute, Dallas, TX.

FIGURE 1.
Composite representation of vendor letter format and content (N=11)

FIGURE 2. Rendering of scores on letters generated using FITNESSGRAM™ software (N=8), example from Body Composition section

Dear Parent:

The ABC School District conducted Physical Fitness Testing recently. Your child was tested in the events below, and achieved the scores indicated. The Healthy Fitness Zone[®] is a range of scores expected for students of the same age and sex. If a score falls within the Healthy Fitness Zone, the student is considered healthy.

Name of Test	Score on Test	Healthy Fitness Zone [®]
Mile Run	11:16	10:00 – 7:30
Body Mass Index	30.9	23.0 – 15.1
Curl Ups	24	21 – 40
Sit Ups	12	9 - 12
Push Ups	14	12 – 25
Sit and Reach	9/9	8

All children should strive to maintain levels of fitness within the Healthy Fitness Zone[®] or above. By maintaining a healthy fitness level for these areas of fitness, your child may have a reduced risk for developing heart disease, obesity, or low back problems. Developing good exercise habits is important to maintaining lifelong health. You can help your child develop these habits by encouraging regular participation in physical activity. Should you have any questions regarding this test, please feel free to contact your child's teacher or the school.

FIGURE 3.

Standard text of form letter used by districts (N=7)

TABLE 1

Reasons for fitness test results notification policy

Districts that notify (N=448)	N (%)
Don't know	126 (28.3)
Importance of child health	109 (24.4)
Required by law	96 (21.5)
Receive individual letters automatically	69 (15.5)
Other	28 (6.3)
Parents or students requested it	18 (4.0)
Districts that do not notify(N=401)	N (%)
Results made available to students (told at test or put in student file)	112 (27.7)
Left up to schools	88 (21.7)
Don't know	74 (18.3)
Small school	35 (8.6)
Cost/No staff/No time	32 (7.9)
Not a priority/Not required	25 (6.2)
Don't receive individual letters	16 (4.0)
Results on the website	13 (3.2)
Other	10 (2.5)

TABLE 2
Content of letters used to notify parents of their child's FITNESSGRAM test results

Content	Type of letter				
	PFT Vendor [†] (N=10)	FITNESSGRAM software (N=8)	Text form letter (N=7)	Other (N=8)	Total (N=33)
BMI *	10 (100%)	4 (50%)	6 (86%)	6 (75%)	26 (79%)
% Body Fat *	0 (0%)	4 (50%)	0 (0%)	2 (25%)	6 (18%)
BMI explanation on score sheet	0 (0%)	1 (13%)	0 (0%)	3 (38%)	4 (12%)
Healthy range of scores	10 (100%)	8 (100%)	7 (100%)	5 (63%)	30 (91%)
Rating of student's score	10 (100%)	7 (88%)	3 (43%)	3 (38%)	23 (70%)
Tips on nutrition or physical activity on score sheet	0 (0%)	8 (100%)	7 (100%)	2 (25%)	17 (52%)
Recommends seeing PMD if student scores fall outside healthy range	0 (30%)	0 (0%)	0 (100%)	1 (13%)	1 (3%)

PFT =Physical Fitness Test; PMD =Primary Medical Doctor

* One district's letter provided both BMI and % body fat; 2 districts' letters did not provide a body composition measure.

[†]The California Department of Education lists 4 possible Physical Fitness Test (PFT) vendors in its guide for new administrators of the Fitness gram.