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Understanding Nutrition Education and Physical Activity Instruction in Rural Elementary Schools

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Abstract. We surveyed K-6 classroom teachers in four rural counties in Oregon to ascertain current nutrition and physical activity and/or physical education (PA/PE) instruction, barriers to teaching these subjects, and interest and need for professional development. Although most respondents reported teaching nutrition and PA/PE in their classrooms and appear to place high importance on teaching these subjects, reported delivery time was low. Extension can play an influential role in ensuring that students receive adequate nutrition and PA/PE instructional time by providing support to teachers through professional development, direct education in the classroom, and policy, systems and environmental change.

INTRODUCTION

The U.S. Dietary Guidelines for Americans 2015–2020 cited schools as an important setting to influence eating patterns (U.S. Department of Health and Human Services and U.S. Department of Agriculture, 2015). However, research shows that elementary students receive little nutrition education in the classroom, and teachers face many barriers to teaching nutrition. Common barriers include limited time, competing academic expectations, lack of training, curriculum materials, and lack of administrative support (Jones & Zidenberg-Cherr, 2015; Perera et al., 2015; Stang et al., 1998).

The school setting is also an important source of activity for children. Huang & Volpe (2004) conducted a study of physical activity behavior, dietary patterns, and nutrition knowledge among children in the third and fourth grades in Massachusetts and found that half of students' physical activity time occurred in physical education (PE) class. Similarly, Bea et al. (2014) studied a group of children in the fourth and fifth grades in Arizona and reported that although most children were active during lunch and morning breaks, 64.5% of students reported they did not have PE the previous school day.

Extension programs across the U.S. partner with schools to deliver nutrition education and physical activity programs. Because of this widespread partnership and expertise, Extension is well positioned to provide teachers with professional development opportunities, but more research is needed to understand the needs of teachers.

We conducted this study to: (a) ascertain the amount of nutrition and physical activity and/or physical education (PA/PE) instruction in rural elementary schools in Oregon, (b) understand what barriers exist to delivering education on these topics, and (c) determine what services Extension can provide to support teachers in these areas.

METHODS

PARTICIPANTS

In 2019, we recruited K-6 teachers with roles in classroom instruction (e.g., classroom, special education, and PE teachers) from school districts in four rural counties in Oregon. Recruitment methods varied by school site depending upon the discretion of the principal. Some principals preferred we invite teachers to take the survey at staff meetings or by email, while others preferred to distribute the survey materials themselves through email.

Of the 281 teachers employed at the participating school districts who were eligible to participate, 130 completed the survey. We excluded survey responses if completed by school staff who did not have roles in classroom instruction in grades K-6. The final sample included in the analysis was 103.

SURVEY

Our survey had 50 questions in four domains: experience teaching nutrition, experience teaching PA and PE, interest and preferences for professional development, and demographic data. We designed our survey questions by building on previous tools developed by Stang et al. (1998) and Jones

& Zidenberg-Cherr (2015). For the questions related to PA and PE, we decided to use both terms to elucidate perceptions regarding all education related to movement in the classroom.

In the domains of experience teaching nutrition and PA/PE, we asked respondents about their time spent teaching each subject, reasons for teaching the subject in their classroom, specific barriers to teaching the subject, interest in subject matter, and collaboration with partners inside and outside of the school community. Demographics questions included grade level and subject(s) taught, years of teaching experience, previous formal education on nutrition and PA/PE, gender, and race/ethnicity. Questions were multiple choice, matrix-style questions, and text entry.

Three reviewers at Oregon State University with expertise in evaluation, nutrition education, and physical activity education reviewed the survey for content validity and face validity. Two teachers outside of the target school districts reviewed the survey for clarity, understandability, and relevancy. We then revised the survey questions. The Oregon State University Institutional Review Board determined this evaluation did not meet the definition of human subjects research.

We administered the survey online using the Qualtrics software program (Qualtrics XM, Provo UT). Responses were anonymous and did not collect identifiable data. All questions were voluntary, and responses were not required for any question.

ANALYSIS

We calculated percentages using the number of respondents for the answer divided by the total number of respondents to the survey (n=103) for all except questions about characteristics. The number of respondents for each question varied due to skip logic in the online survey structure as well as participant drop off for demographics questions. We calculated questions about participant characteristics using the total number of respondents for each question.

RESULTS

NUTRITION AND PHYSICAL ACTIVITY AND/OR PHYSICAL EDUCATION INSTRUCTION

We asked whether teachers included nutrition in their classroom curriculum and 64.1% (n=66) reported they did, while 35.9% (n=37) of respondents never had. Of those who included nutrition, 48.5% (n=32) taught it on its own as a separate subject and 47.0% (n=31) combined it with other subjects. Figure 1 illustrates the number of hours of nutrition instruction teachers reported in their classroom during one school year.

We asked if respondents had ever included PA/PE in their classroom curriculum and 73.8% (n=76) reported they did and 20.3% (n=21) did not. Of those who did, 40.8% (n=42) taught it on its own as a separate subject and 24.3% (n=25) combined it with other subjects. Figure 2 illustrates the number of hours of PA/PE instruction teachers reported in their classroom during one school year. Additionally, 71.8% (n=74) of respondents indicated their school had a PE teacher and 18.4% (n=19) indicated that they collaborate with a PE teacher to teach PA/PE in their classroom.

The top reasons teachers gave for teaching nutrition included it is an important topic (53.4%, n=55), they enjoyed teaching it (24.3%, n=25), and the students were interested in it (22.3%, n=23). For PA/PE, the top responses were it is an important topic (52.4%, n=54), the students are interested (45.6%, n=47), and it is required by education standards (31.1%, n=32). Figure 3 shows the factors that affect how often nutrition and PA/PE are taught.

INTEREST IN AND PREFERENCE FOR PROFESSIONAL DEVELOPMENT

More than two-thirds of teachers were interested in professional development on nutrition and PA/PE with 14.6% (n=15) indicating they were definitely interested and 55.3% (n=57) saying they were possibly interested. We asked teachers if they were interested in receiving continuing education units (i.e. professional development units) for participating in professional development and 34.0% (n=35) were definitely interested, 42.7% (n=35) were possibly interested, and 11.7% (n=12) were not at all interested.

Teachers were most interested in learning about curricula and teaching materials (43.7%, n=45), resources they can share with families (39.8%, n=41), and how to combine nutrition with other subjects like science, mathematics, and English language arts (35.0%, n=36). Top nutrition topics of interest were nutrition and academic performance (39.8%, n=41) and nutrition and growth and development (35.9%, n=37). For PA/PE, teachers were most interested in learning about links between physical activity and classroom attention (51.5%, n=53) and links between physical activity and academic achievement (47.6%, n=49).

We asked about continued support after participating in professional development and 34.0% (n=35) of teachers indicated they were interested in receiving continued support, 8.7% (n=9) were not interested, and 27.2% (n=28) were not sure. We asked participants if they were aware that Oregon State University Extension Service provides curriculum, professional development, resources to support nutrition, and PA/PE in schools prior to receiving the survey and 42.7% (n=44) of respondents said they were. We also asked whom teachers have collaborated with to teach nutrition and PA/PE. For nutrition, 31% (n=32) of teachers reported collaborating with Oregon State University Extension Service and for PA/PE, 3.9% (n=4) indicated they did the same.

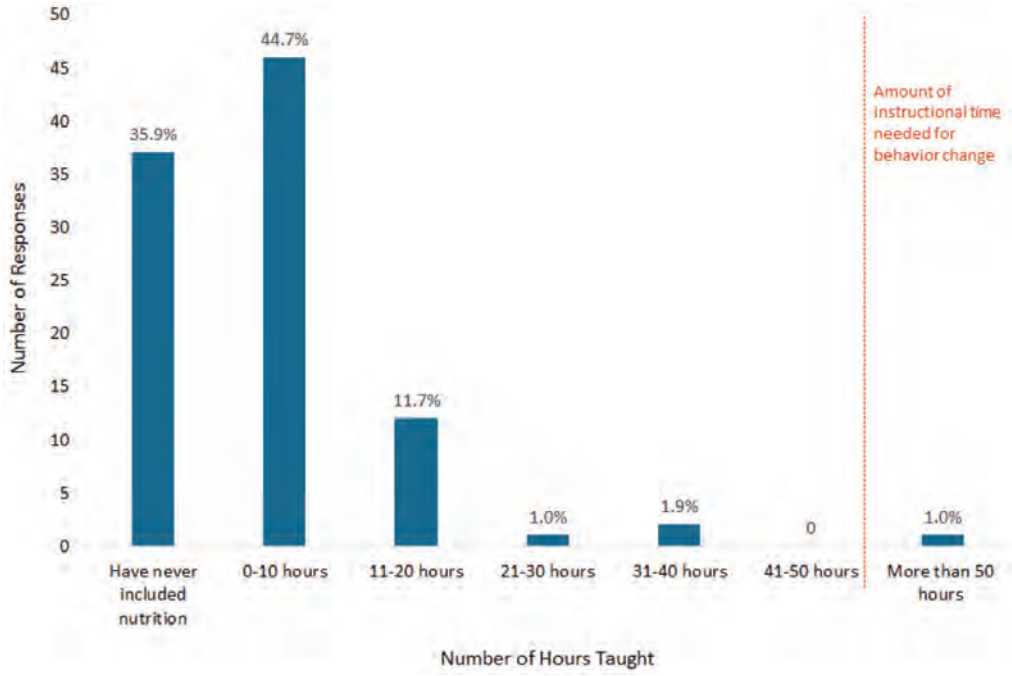

Figure 1. Hours of nutrition instruction in the classroom.

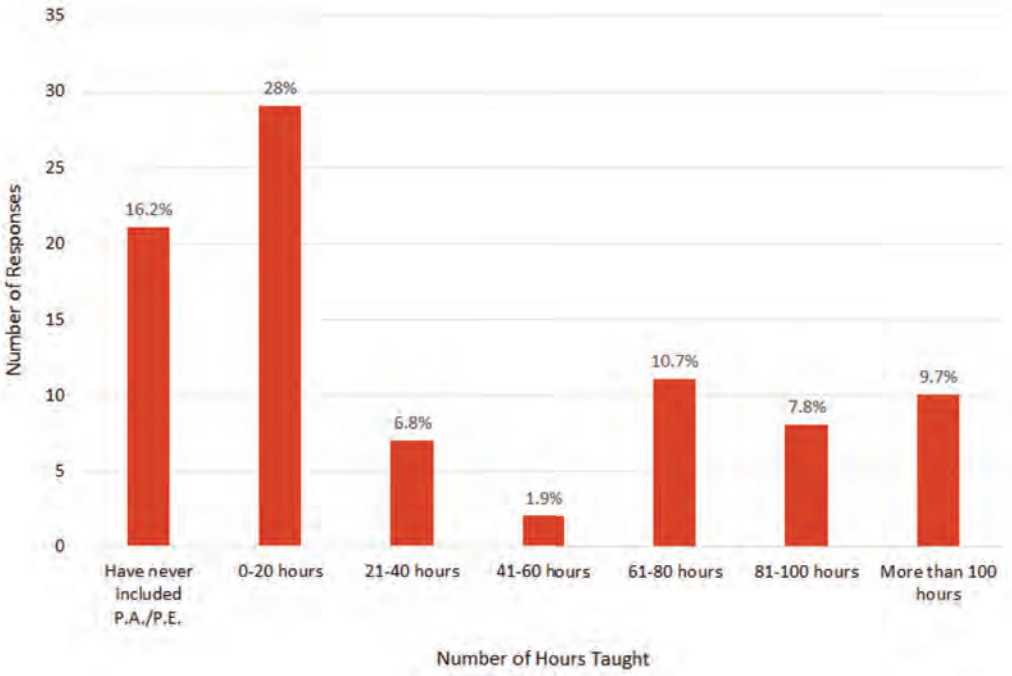

Figure 2. Hours of physical activity and/or physical education instruction in the classroom.

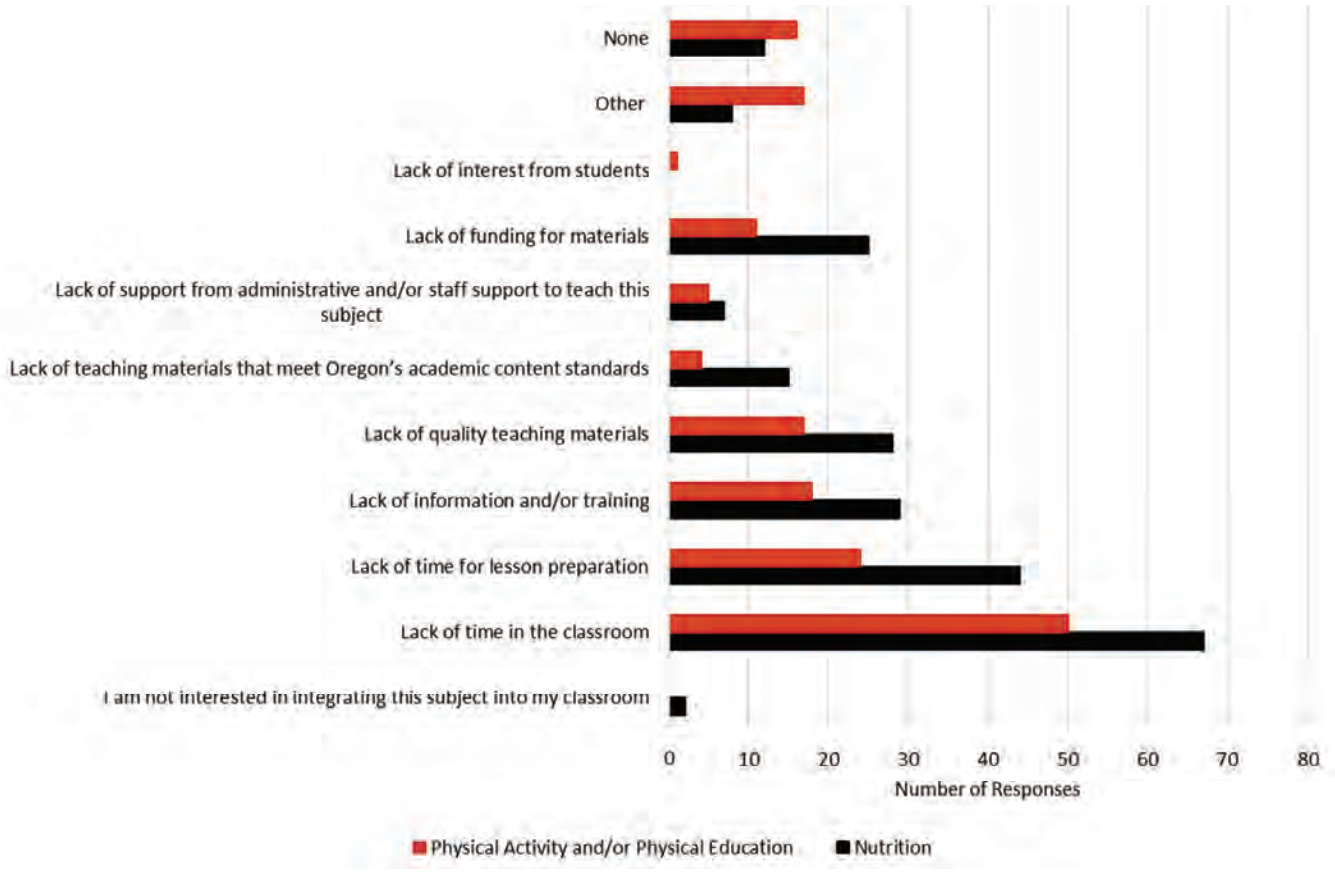

Figure 3. Factors affecting integrating nutrition and physical activity and/or physical education into the classroom.

PARTICIPANT CHARACTERISTICS

The majority of participants were female (81.5%) and white (85.2%), taught a variety of grades from Kindergarten to Sixth Grade, and had a variety of teaching experience. Table 1 includes the characteristics reported by study participants.

DISCUSSION

Most respondents reported teaching nutrition and PA/PE, but the amount of time teachers reported delivering lessons was low. Most teachers reported teaching less than 10 hours of nutrition education and less than 20 hours of PA/PE annually. This is far below the 50 hours Connell et al. (1985) suggest are necessary to see changes in nutrition knowledge, attitude and behaviors, and the time required for physical education in Oregon (Oregon Senate Bill 4, 2017). In our sample, PA/PE instruction time was generally higher than nutrition. The difference is likely due to the presence of dedicated staff to teach PE, with nearly three-quarters of participants indicating their school has a PE teacher and state policy requiring PE in elementary schools.

The most-cited reason for teaching these subjects was they thought it was an important topic. The most common barriers to delivering nutrition education and PA/PE education were lack of time in the classroom, lack of time for lesson preparation, lack of information and/or training, and lack of quality teaching materials. Although these factors were reported by teachers for both nutrition and PA/PE, more respondents indicated barriers for nutrition than PA/PE.

Nearly two-thirds of respondents indicated lack of time in the classroom as a barrier and nearly half reported that lack of time for lesson preparation was a barrier, which is consistent with previous research (Jones & Zidenberg-Cherr, 2015; Linnell et al., 2016; Perera et al., 2015; Stang et al., 1998). Due to the consistency of teachers citing these barriers over time, these are barriers that need to be addressed.

One factor that explains the barrier of a lack of time is that state education standards require teachers to focus on other subjects. A recently passed law in Oregon (Oregon Senate Bill 4, 2017) requires schools to implement PE for 150 minutes per week by the 2020-2021 school year, but there is no similar regulation for nutrition education outside of health education standards. To address this issue, state-level policies requiring nutrition education in elementary classrooms could substantially increase instruction time.

Table 1. Participant Characteristics

Characteristic	n	%
Gender (n=81)		
Male	15	18.5
Female	66	81.5
Race/Ethnicity (n=78)		
American Indian/Native American	1	1.3
Asian	2	2.6
Black	0	0
Hispanic or Latino	5	6.4
Native Hawaiian or Pacific Islander	1	1.3
White	69	85.2
Grades taught (n=82)[a]		
Kindergarten	10	9.7
First grade	14	13.6
Second grade	15	14.6
Third grade	29	28.2
Fourth grade	22	21.4
Fifth grade	21	20.4
Sixth grade	21	20.4
Teaching experience (n=82)		
Less than 1 year	5	6.1
1–5 years	24	29.3
6–10 years	9	11.0
11–15 years	23	28.1
16–20 years	9	11.0
More than 20 years	12	14.6

[a]Some respondents reported teaching more than one grade.

With little experience teaching nutrition and PA/PE, it may be more difficult for teachers to create activities and integrate nutrition into other subjects. Additionally, it is plausible that teachers with less experience could have low self-efficacy for teaching these subjects. Low self-efficacy could lead to lack of motivation to create time for the subjects in the classroom (Linnell et al., 2016). To address this, professional development opportunities offered by Extension professionals should aim to build self-efficacy as a program outcome. Additionally, many teachers reported Extension staff and PE specialists teach these subjects in their classrooms. This may suggest that although teachers face barriers to teaching these subjects themselves, they may be willing to make time for others to teach in their classrooms.

Regarding the barriers to information, training, and teaching materials, Extension has resources and expertise including experienced nutrition educators and evidence-based curricula to address the barriers. Professional development programs should integrate training on content and teaching materials to address these barriers.

LIMITATIONS

Many respondents indicated collaborating previously with Extension to deliver nutrition and PA/PE instruction. These relationships may have influenced who responded, resulting in response bias. Additionally, contact methods varied by school and district which may have influenced the response rates. Since respondents were from four counties, the results may not be generalizable to the entire state of Oregon. Lastly, the structure of questions linking PA and PE instruction limited our ability to analyze these separately.

CONCLUSION

Based on our observations, we suggest Extension can contribute to increased instructional time for nutrition and PA/PE through direct education. In addition to providing classroom education, Extension can provide professional development programs that enhance access to quality teaching materials and increases content knowledge and self-efficacy. We also recommend that professional development for teachers includes recommendations for quality teaching materials and resources that align with education requirements, provide training for integrating nutrition and PA/PE into other subjects to align with academic standards, and help teachers develop knowledge in nutrition and PA/PE in the areas they are most interested in.

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