Association Between Health-Enhancing Community Environment and Early Childhood Education Classroom Health Practices.

Bethany D. Williams, MSH, PhD Candidate

Department of Nutritional Sciences I College of Allied Health I University of Oklahoma Health Sciences Center

NOPREN EC Workgroup Presentation, October 19, 2020 @12pm CST

OUTLINE

- Background & Study Purpose
  - Early Childhood Education
  - Community Impact on Health
  - Specific Aims
  - Hypotheses
- Survey and Measures
- Study Findings
- Conclusions

PROMOTING HEALTH IN ECES

- The early childhood years are formative and essential for developing preferences and behaviors.[1]
- Child behavior is influenced by practices and attitudes of primary caregivers, including those involved in their daily out-of-home care.[2]
- Therefore, settings for early childhood education (ECEs) are ideal for promoting health-related patterns (i.e. physical activity and nutrition).

1. Benjamin et al., 2008
2. Maher et al., 2008.

ECE CLASSROOM BEST PRACTICES

Nutrition

- Offering fruits, vegetables, and lean proteins.
- Encouraging children to try new or less preferred foods.
- Serving meals family style.

Physical Activity

- Providing indoor and outdoor active playtime.
- Providing indoor and outdoor teacher-led physical activity.
- Portable play equipment.

Gubbels et al., 2010
Pate et al., 2004.

ECE CLASSROOM BEST PRACTICES

Nutrition

- Offering fruits, vegetables, and lean proteins.
  Financial concerns.
- Encouraging children to try new or less preferred foods.
  Children's preferences.
- Serving meals family style.
  Food waste.

Physical Activity

- Providing indoor and outdoor active playtime.
  Lack of proper outerwear.
- Providing indoor and outdoor teacher-led physical activity.
  Lack of space.
- Portable play equipment.
  Lack of resources.

Dev et al., 2017.
Copeland et al., 2009.

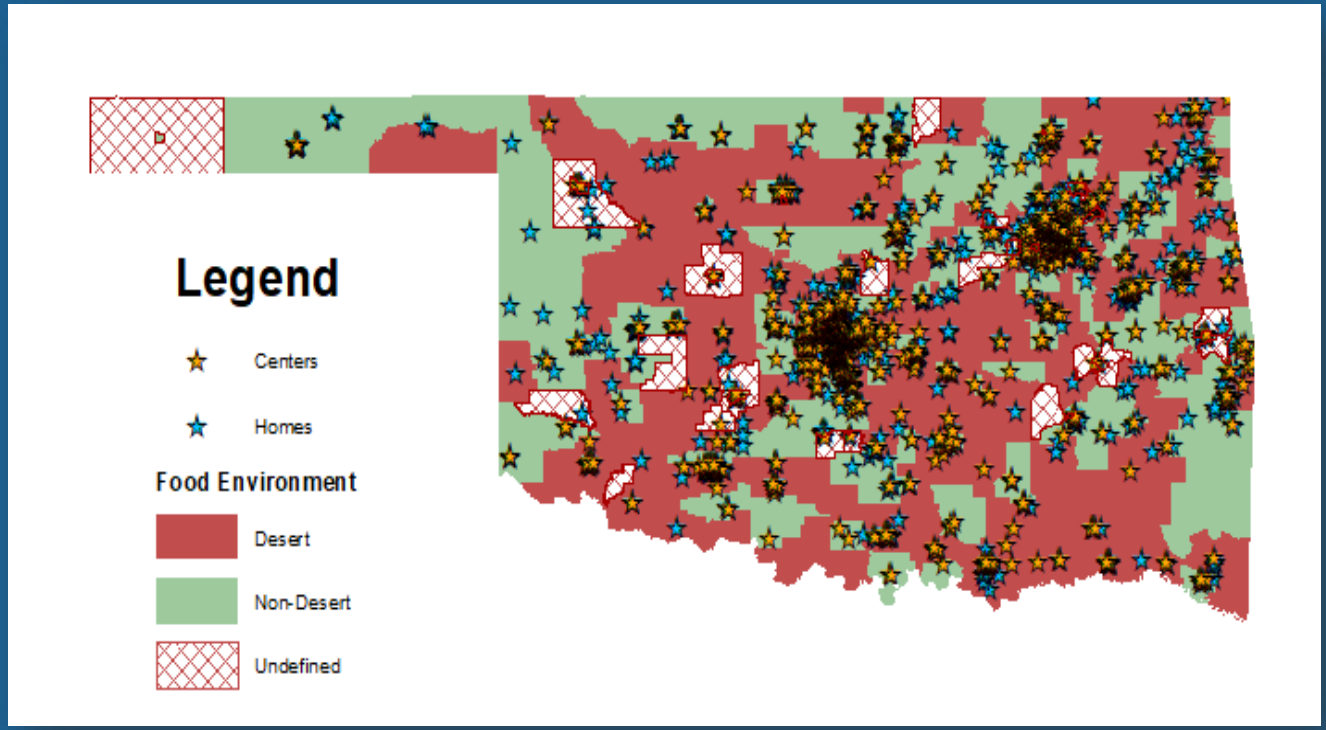
COMMUNITY IMPACT ON HEALTH

Nutrition

- Lack of access to healthy food outlets, and higher density of fast food outlets, is related lower-quality diets in all age groups.[1]

Physical Activity

- Lack of access to parks and poor walkability are related to decreased levels of physical activity in all age groups.[2-3]



1. Drewnowski et al., 2004.
2. Sallis et al., 2016.
3. Roemmich et al., 2006.

PURPOSE

The primary goal of this study is to understand the relationship between the community around an ECE and classroom health practices by program arrangement (Head Start, community based childcare, family childcare home).

PURPOSE

- Specific Aim 1. Determine the relationship between health of community environments with physical activity and nutrition classroom practices in Oklahoma ECEs. *We hypothesized that closer community access to healthy environments will positively influence best practice implementation in the classroom.*

- Specific Aim 2. Determine the relationship between health of community environments with barriers to implementing physical activity and nutrition classroom practices in Oklahoma ECEs. *We hypothesized that community access to healthy environments will influence type of perceived barriers reported by center directors.*

"COMMUNITIES & CLASSROOM HEALTH" SURVEY

- Statewide survey including **directors** of licensed childcare settings in Oklahoma that serve children 3 to 5 years old.

- Data collection November 2019 to February 2020.
  - Mailed surveys
  - Email distribution of online survey link
  - Phone call follow-ups for non-respondents

- Collected information on center location and characteristics, and classroom health practices and barriers.

CLASSROOM HEALTH PRACTICES AND BARRIERS

- Classroom Health Practices
  - Nutrition and Physical Activity Self-Assessment for Child Care (NAPSACC)[1]
  - Items answered on a Likert-type scale from one to four, with higher scores indicating either higher frequency or healthier degree of health practice implementation
  - Item scores were averaged to calculate sub-scores within categories of practice types, determined by the NAPSACC
  - Sub-scores were summed to calculate a total Physical Activity and Nutrition health score

- Barriers to Classroom Health Practices
  - Derived from previous statewide survey[2]
  - Additional barriers identified in the literature[3-5]

1. Benjamin et al., 2007
2. Garcia et al., 2018.
3. Allison et al., 2016.
4. Copeland et al., 2009
5. Copeland et al., 2012

HEALTH OF COMMUNITY ENVIRONMENTS

- *Physical Activity Environments* → "PA Desert"[2]
  - Geocoded locations of parks and playgrounds in Oklahoma
    - Dataset of point locations exported from Google Earth
    - Each location confirmed with Google Earth and Maps Streetview
  - "National Walkability Index"[1] from 2010 Census Data
    - Range 1 to 20, >10.5 considered "Walkable"

  No park or playground within 1 mile radius of ECE, *OR*

  Walkability Index ≤ 10.5

- *Nutrition/Food Environments* → "Food Desert"[3]
  - Geocoded locations of grocery stores in Oklahoma
    - In-person audit conducted in 2016

  No grocery stores within specified radius of ECEs

  - 1 mile for Urban sites
  - 10 miles for Rural sites

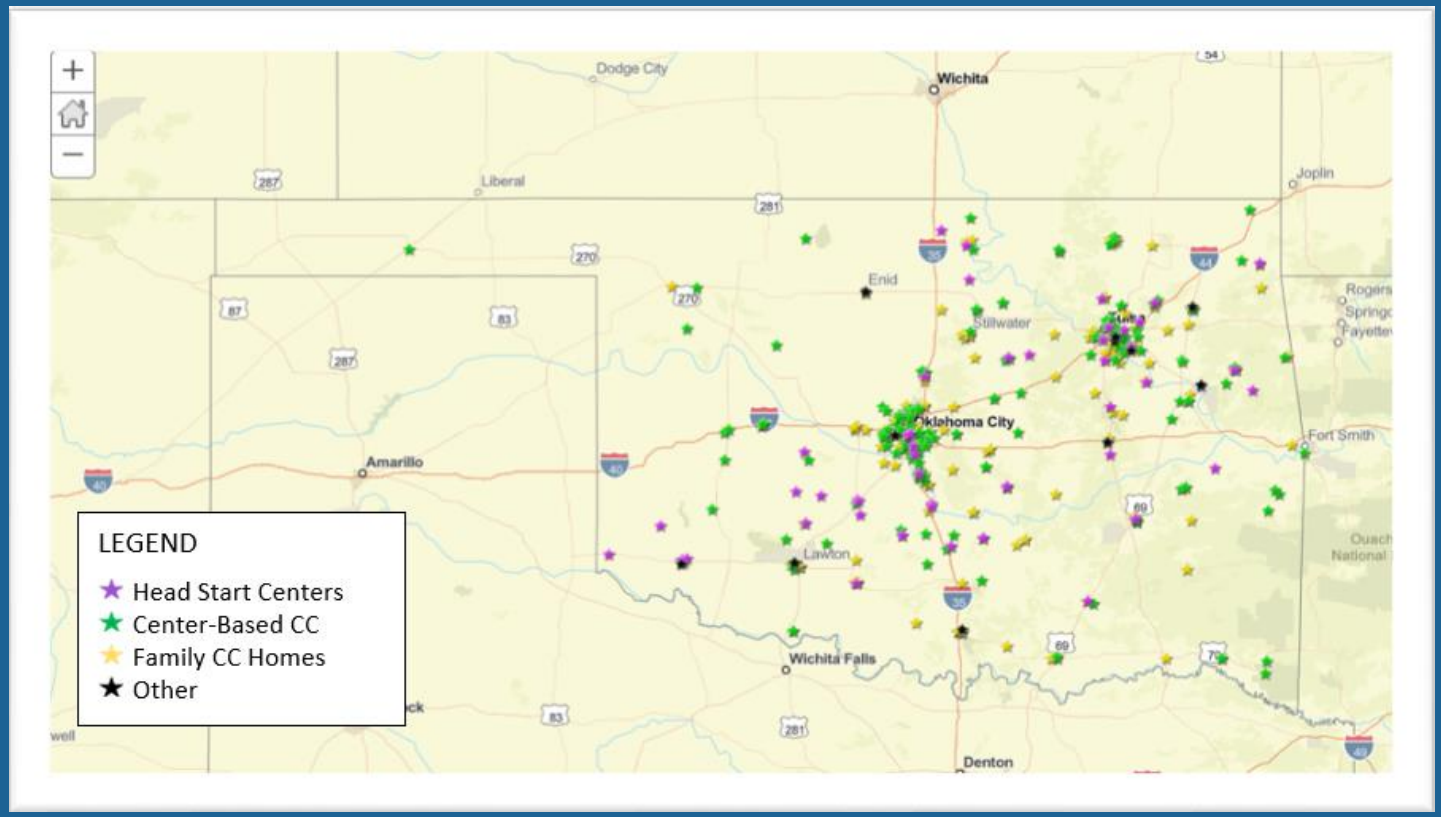
1. Frank et al., 2009.
2. Frank et al.. 2012.
3. Moore et al., 2006.

STATISTICAL ANALYSIS

- Means, frequencies and variable re-coding were performed in SAS 9.4
- Non-parametric methods were used for all analyses
  - Kruskal-Wallis one-way analysis of variance
  - Wilcoxon Rank Sum test
  - Fisher's Exact test
  - Spearman's rank correlation
- P-values were adjusted for multiple comparison

FINAL STUDY SAMPLE

- Final Sample (N=470) :
  - 64 Head Starts (32% response rate)
  - 207 Community-based CC (20.7% response rate)
  - 189 Family CC homes (11.4% response rate)
  - 10 Public Pre-K or “Other” (n/a, ineligible)



SAMPLE CHARACTERISTICS

- Head Start centers (*n*=54)
  - Had the highest percent of teachers with a Bachelor's degree or higher
  - Had the highest number of supporting staff (non-teachers)
- Community-Based Childcare (*n*=159)
  - Served the highest number of total children
  - Had the highest percent tribally affiliated (37.9%)
- Family Child Care Homes (*n*=160)
  - Had the lowest number of staff and children
  - Were mostly participating in CACFP (88.0%)

COMMUNITY PHYSICAL ACTIVITY ENVIRONMENTS & CLASSROOM HEALTH PRACTICES

MAP OF OKLAHOMA
ECES, PLAYGROUNDS, AND WALKABILITY

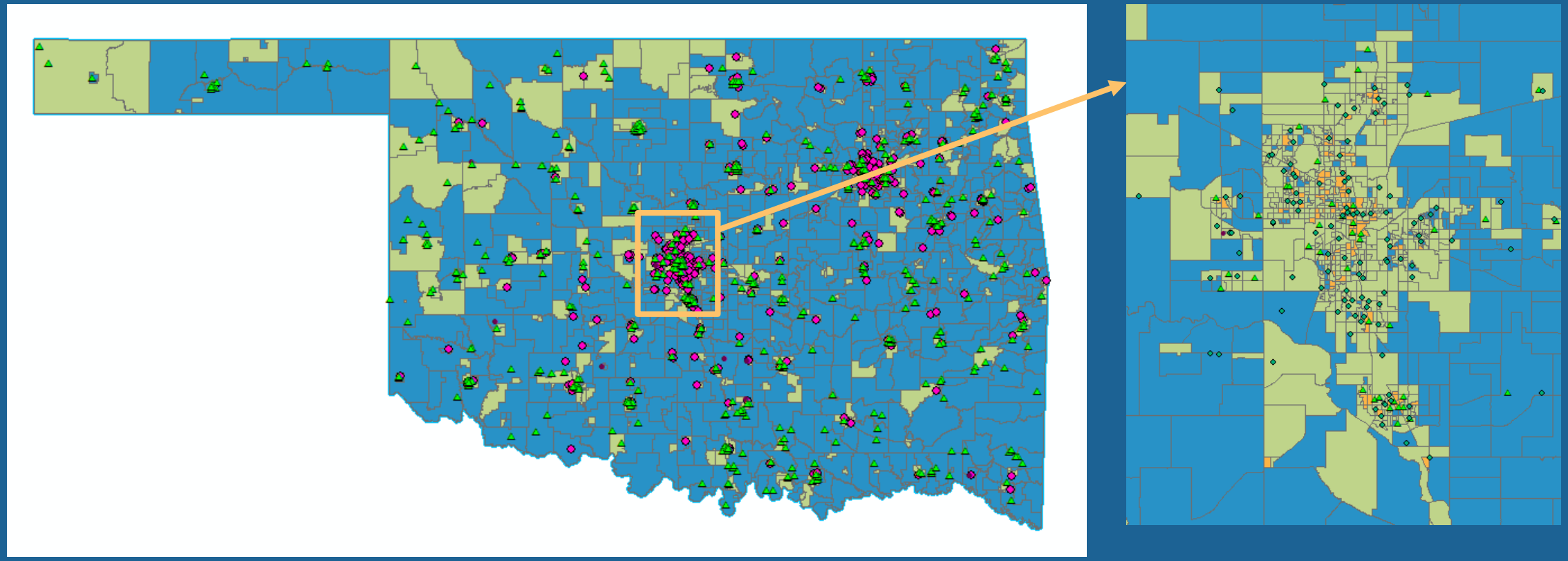


TABLE 1. Characteristics of the center and community PA environment, by child care context.			
	Head Start (*n*=51)	**CBC (*n*=155)**	**FCCH (*n*=159)**
Out-of-Center Community Engagement [n (%)]			
Very often or Somewhat often	9 (17.6)	42 (27.3)	40 (25.2)
Not very often or Never	42 (82.2)	111 (72.4)	118 (74.6)
Number of Parks/Playgrounds (mean ± SD)			
Within 1 mile	0.7 ± 1.1	0.5 ± 0.9	0.2 ± 0.7
Within 5 miles	3.4 ± 3.7	3.7 ± 3.1	2.7 ± 2.6
Within 10 miles	5.3 ± 5.0	7.4 ± 5.0	6.8 ± 5.5
Presence of Parks/Playgrounds in Buffer [n (%)]			
≥1 Within 1 mile	20 (39.2)	49 (31.6)	28 (17.6)
≥1 Within 5 miles	36 (70.5)	130 (83.8)	127 (79.8)
≥1 Within 10 miles	42 (82.3)	141 (90.9)	140 (88.0)
Neighborhood Walkability (mean ± SD)	7.9 ± 2.9	8.5 ± 2.4	7.2 ± 2.3
Classification of Neighborhood Walkability [n (%)]			
Below average walkability (≤10.5)	39 (76.4)	120 (77.4)	145 (91.1)
Acceptable to ideal walkability (>10.5)	12 (23.5)	35 (22.5)	14 (8.8)
PA Desert Status by Urban/Rural [n (%)]			
Urban, PA Desert	22 (43.1)	90 (58.0)	92 (57.8)
Urban, Non-Desert	2 (3.9)	6 (3.8)	4 (2.5)
Rural, PA Desert	19 (37.2)	45 (29.0)	61 (38.6)
Rural, Non-Desert	8 (15.6)	14 (9.0)	2 (1.2)
CBC= Community-Based Childcare; FCCH= Family Child Care Homes.			

PHYSICAL ACTIVITY CLASSROOM PRACTICES & BARRIERS

Head Starts	CBCs	FCCHs
▪ Highest (healthiest) classroom physical activity practice scores ▪ Lowest prevalence of reporting barriers overall	▪Highest score for implementing "Active Play and Inactive Time" classroom practices ▪Highest prevalence of reporting barriers such as providers being unsure how to promote PA (13%) and lack of space for storing play equipment (41%)	▪Lowest overall classroom physical activity practice scores, especially for presence of activity-focused policies ▪Highest prevalence of reporting lack of resources to purchase play equipment (43.4%)

ASSOCIATIONS BETWEEN THE COMMUNITY PHYSICAL ACTIVITY ENVIRONMENT WITH CLASSROOM HEALTH PRACTICES

Number of Nearby Parks & Playgrounds

- For Family Child Care Homes only- Number of parks within **10 miles** of ECE was positively associated with classroom practice total scores, and most sub-scores ($p<0.01$ for all).
- Not associated with classroom health practices in Head Starts or CBCs.

Neighborhood Walkability Index

- For Head Starts only- Positively associated with "Supporting Physical Activity" classroom practice score ($p<0.001$).
- Not associated with classroom health practices in CBCs or FCCHs.

"PA Desert Status" , i.e. presence of parks and walkability

- Not associated with classroom health practices or barriers in Head Starts, CBCs or FCCHs.

COMMUNITY NUTRITION ENVIRONMENTS & CLASSROOM HEALTH PRACTICES

MAP OF OKLAHOMA ECES AND GROCERY STORES

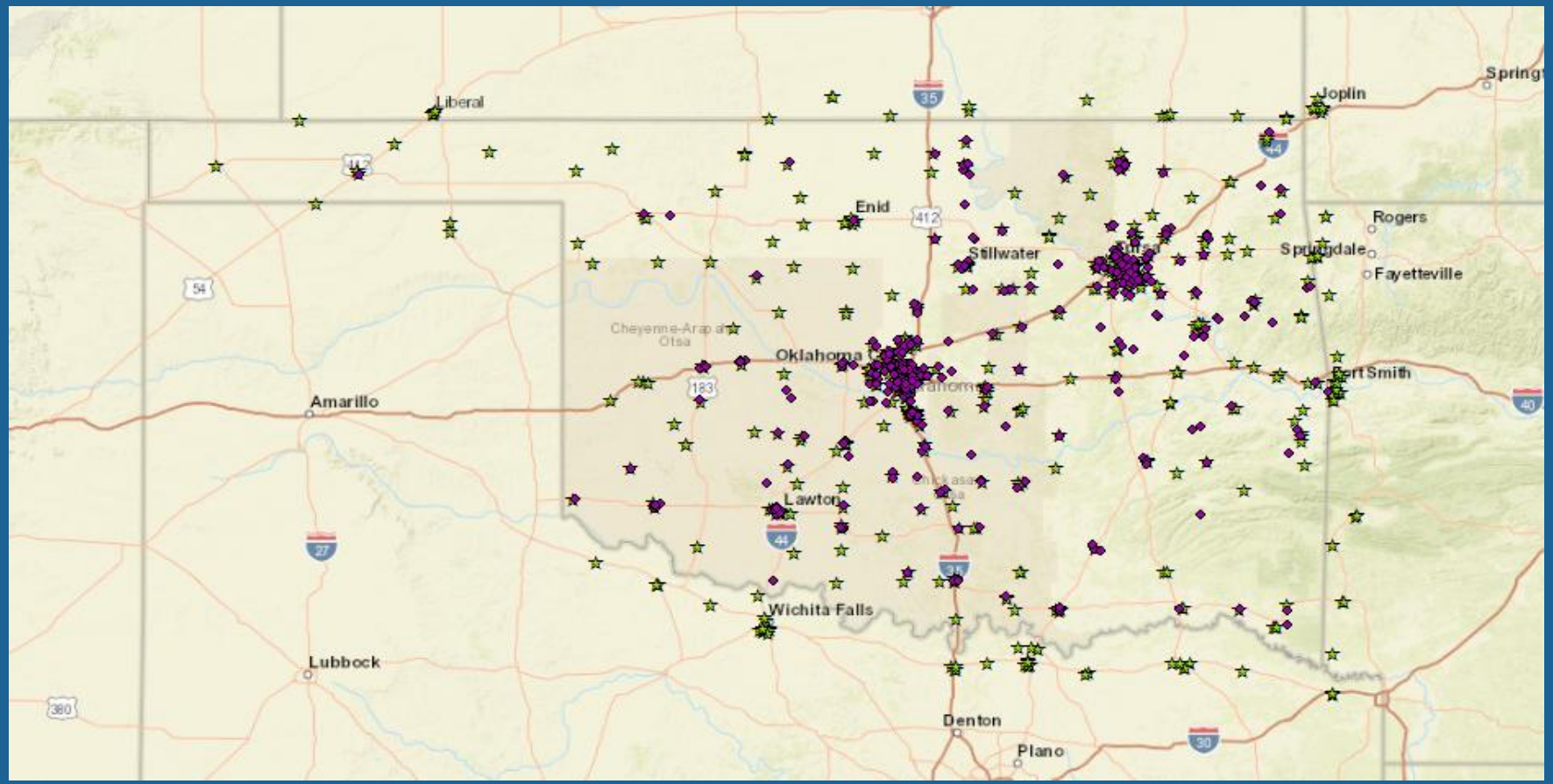


TABLE 2. Characteristics of the center and community food environment, by child care context.			
	Head Start (*n*=51)	**CBC (*n*=155)**	**FCCH (*n*=159)**
Professional Program Participation [n (%)]			
CACFP	53 (98.5)	99 (62.2)	142 (88.7)
Go NAP SACC	4 (7.4)	6 (3.7)	3 (1.8)
Certified Early Childhood	11 (20.3)	19 (11.9)	10 (6.2)
Methods for Purchasing Center Foods [n (%)]			
In-person shopping at a store	7 (13.2)	53 (33.9)	124 (77.5)
Online ordered then picked up in-person	1 (1.8)	38 (24.3)	27 (16.8)
Online and delivered	23 (43.4)	44 (28.2)	8 (5.0)
Over the phone with a vendor	22 (41.5)	21 (13.4)	1 (0.6)
Roundtrip Miles to Purchasing Center Foods (mean ± SD)	11.6 ±13.7	15.5 ± 21.3	18.7 ± 22.6
Person Responsible for Center Meal Planning [n (%)]			
Owner/Director	5 (9.2)	65 (40.8)	152 (95.0)
Cook or Chef	18 (33.3)	81 (50.9)	5 (3.1)
Catering Company	2 (3.7)	1 (0.6)	0 (0.0)
Dietician	15 (27.7)	4 (2.5)	0 (0.0)
Located within a “Food Desert” [n (%)]	13 (24.0)	44 (27.6)	59 (36.8)
Distance in Miles to Nearest Grocery Store (mean% ± SD)	2.2 ± 3.3	1.5 ± 2.6	2.3 ± 3.1

CBC= Community-Based Childcare; FCCH= Family Child Care Homes; CACFP= Child and Adult Care Food Program; NAPSACC= Nutrition and Physical Activity Self-Assessment for Child Care.

NUTRITION CLASSROOM PRACTICES & BARRIERS

Head Starts	CBCs	FCCHs
▪ Had healthiest overall classroom nutrition practices, especially mealtime practices, education, and presence of policies. ▪ Were most likely to report having lack of control over foods provided (31.4%). ▪ Lowest prevalence of reporting barriers overall	▪Were most likely to report barriers to serving healthful food and beverages, including lack of money for healthful foods (37.%), lack of knowledge (12.5%), child preference (36.7%), and not knowing which guidelines to follow (19.8%).	▪Had least healthy overall classroom nutrition practices, especially for mealtime practices and presence of policies. ▪Were most likely to report barriers to implementing mealtime practices, including lack of time (35.6%) and staff (24.5%).

ASSOCIATIONS BETWEEN THE COMMUNITY NUTRITION ENVIRONMENT WITH CLASSROOM HEALTH PRACTICES

"Food Desert Status", i.e. presence of grocery stores

- For Head Starts- Presence of grocery stores was not associated with classroom health practices or barriers.

- For CBCs only- Those located within a "Food Desert" reported healthier classroom practices, specifically for meats, fats and grains served, compared to those in Non-Deserts.

- For FCCHs only- Those located within a "Food Desert" reported higher barriers to nutrition practices, specifically concern for food waste, limited storage space, and not knowing what recommendations to follow, compared to those in Non-Deserts.
  - *This relationship remained significant in exploratory analyses stratified by CACFP participation, and in CACFP participating FCCHs only.

STRENGTHS & LIMITATIONS

Strengths

- Parks and playground data partially validated with 100% Google image search
- Grocery store data validated via in-person audit
- Statewide sample representing each of the three primary ECE contexts
- Validated NAPSACC tool to assess classroom health practices

Limitations

- Cross-sectional study design
- Locations of grocery stores determined in 2016
- Data were self-reported, and subject to social desirability and selection bias
- Sample size were somewhat limited in stratified analyses
- Primary respondent were program directors

SUMMARY OF FINDINGS

- Overall, Head Start centers reported higher/healthier scores for classroom health practices and lower barriers to implementing, whereas Family Child Care Home providers employed least healthful classroom practices and experience common barriers consistent with previous literature.

- Healthfulness of community environments for both physical activity and nutrition mostly did not influence classroom practices or barriers for Head Starts or CBCs.

- For Family Child Care Homes only:
  - Higher number of parks and playgrounds within the community was associated with healthier classroom physical activity practice scores.
  - Lack of access to grocery stores was related to higher barriers to serving healthful foods and beverages.

CONCLUSIONS & IMPLICATIONS FOR RESEARCH

- This study provides insight into how the surrounding community is related to ECE classroom health, which is essential to inform program and community resources promoting health for young children.

- Given these findings, future studies should seek to examine:
  - whether context-specific practices such as community engagement and food prep/planning methods influence implementation of classroom health practices across ECE contexts;
  - whether perceived constructs of the community health environment are related to classroom health practices and barriers for differing contexts of ECEs.

- These findings suggest a need for future research and policy implementation to provide support for FCCHs residing in low-access areas who experience difficulty implementing practices promoting health for the children they serve.

ACKNOWLEDGEMENTS

- Funding & Financial Support:
  - Early Care and Research Scholars: Head Start Graduate Student Research Grant (HHS2017-ACF-OPRE-YR-1219)
  - OUHSC College of Allied Health Student Research and Creativity Grant
  - OUHSC Department of Nutritional Sciences
- Child Care Providers & Study Participants
- Community Partners: Kay Floyd with the Office of Head Start Collaboration, Linda Whaley and additional partners with the Oklahoma Department of Human Services, Oklahoma State Department of Health, Oklahoma Association for the Education of Young Children, and Oklahoma Child Care Association.
- Dr. Susan Sisson & the Behavioral Nutrition and Physical Activity Laboratory
- Scientific Advisory & Dissertation Committee Members: Drs. Bryce Lowery, Janis Campbell, Dipti Dev, Diane Horm, Denise Finneran, Jennifer Graef.
- Student & Volunteer Research Team: Daisy Butzer & Cassandra Camp.

REFERENCES

- Allison KR, Vu-Nguyen K, Ng B, Schoueri-Mychasiw N, Dwyer JJ, Manson H, Hobin E, Manske S, Robertson J. Evaluation of Daily Physical Activity (DPA) policy implementation in Ontario: surveys of elementary school administrators and teachers. (2016). BMC public health, 1;16(1):746.
- Benjamin SE, Neelon, B, Ball, SC, Bangdiwala, SI, Ammerman, AS, Ward, DS. (2007). Reliability and validity of a nutrition and physical activity environmental self-assessment for child care. The international journal of behavioral nutrition and physical activity, 4(29).
- Benjamin, S.E., Cradock, A., Walker, E.M., Slining, M., & Gillman, M.W. (2008). Obesity prevention in child care: a review of U.S. state regulations. BMC Public Health, 8, 188. doi:10.1186/1471-2458-8-188.
- Copeland, K. A., Sherman, S. N., Kendeigh, C. A., Saelens, B. E., & Kalkwarf, H. J. (2009). Flip flops, dress clothes, and no coat: clothing barriers to children's physical activity in child-care centers identified from a qualitative study. Int J Behav Nutr Phys Act, 6, 74. doi:10.1186/1479-5868-6-74
- Copeland KA, Kendeigh CA, Saelens BE, Kalkwarf HJ, Sherman SN. (2012). Physical activity in child-care centers: do teachers hold the key to the playground? Health education research, 1;27(1):81-100.
- Dev, D. A., Carraway-Stage, V., Schober, D. J., McBride, B. A., Kok, C. M., & Ramsay, S. (2017). Implementing the Academy of Nutrition and Dietetics Benchmarks for Nutrition Education for Children: Child-Care Providers' Perspectives. J Acad Nutr Diet, 117(12), 1963-1971 e1962. doi:10.1016/j.jand.2017.07.001.

REFERENCES, CONT.

- Drewnowski A., Specter S.E. (2004). Poverty and obesity: the role of energy density and energy costs. Am J Clin Nutr, 79(1):6-16.
- Frank LD, Sallis JF, Saelens BE, Leary L, Cain K, Conway TL, Hess PM. (2010). The development of a walkability index: application to the Neighborhood Quality of Life Study. British journal of sports medicine, 1;44(13):924-33.
- Frank LD, Saelens BE, Chapman J, Sallis JF, Kerr J, Glanz K, Couch SC, Learnihan V, Zhou C, Colburn T, Cain KL. (2012). Objective assessment of obesogenic environments in youth: geographic information system methods and spatial findings from the neighborhood impact on kids study. American journal of preventive medicine, 1;42(5):e47-55.
- Garcia AS, Dev DA, Stage VC. (2018) Predictors of Parent Engagement Based on Child Care Providers' Perspectives. Journal of nutrition education and behavior, 1;50(9):905-12.
- Gubbels, J. S., Kremers, S. P., Stafleu, A., Dagnelie, P. C., de Vries, N. K., & Thijs, C. (2010). Child-care environment and dietary intake of 2- and 3-year-old children. J Hum Nutr Diet, 23(1), 97-101. doi:10.1111/j.1365-277X.2009.01022Maher, E. J., Li, G., Carter, L., & Johnson, D. B. (2008). Preschool child care participation and obesity at the start of kindergarten. Pediatrics, 122(2), 322-330. doi:10.1542/peds.2007-2233
- Moore LV, Diez Roux AV. (2006). Associations of neighborhood characteristics with the location and type of food stores. American journal of public health, 96(2):325-31.

REFERENCES, CONT.

- Pate, R. R., Pfeiffer, K. A., Trost, S. G., Ziegler, P., & Dowda, M. (2004). Physical activity among children attending preschools. Pediatrics, 114(5), 1258-1263. doi:114/5/1258 [pii] 10.1542/peds.2003-1088-L
- Roemmich J.N., Epstein L.H., Raja S., Yin L., Robinson J., Winiewicz D. (2006). Association of access to parks and recreational facilities with the physical activity of young children. Prev Med, 43(6):437-41.
- Sallis, J.F., Owen, N., & Fisher, E.B. (2008). Ecological Models of Health Behavior. Health Behavior and Health Education: Theory, Research, and Practice(4), 465-486.

QUESTIONS FOR YOU:

1. Do these findings represent your experience in the EC community?
2. Which of these findings do you feel would be most helpful for the EC community to learn more about?
3. Are there any additional questions we can help to answer with this data?

Thank you for your time! Feel free to contact me directly at:

Bethany-Williams@ouhsc.edu

405.271.8001 ext. 41173