Nutrition Research and Policy:
Implications for Best Practices in Early Childhood Education Programs

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Nutrition is a current key issue with over 78 million adults and about 12.5 million children and adolescents in America considered obese (Finucane et al., 2011). Approximately 40% of U.S. children ages 2 to 5 are overweight or at the risk of being overweight (Ogden, Carroll, Kit, & Flegal, 2012). Diet has been identified as one of the leading factors contributing to childhood obesity (O'Dea & Wilson, 2006). Early childhood education programs provide opportune settings to establish healthful attitudes and knowledge about food and nutrition.

Nutrition in Early Childhood Programs

Nationwide there are approximately 15 million children under the age of 6 that are in non-parental childcare programs (Child Care Aware of America, 2012). Specifically, "preschool children enter care as early as six weeks of age and can be in care for as many as 40 hours a week until they reach school age" (Story, Kaphingst, & French, 2006, p. 145). Consequently, with increasing numbers of children attending child care, these programs contribute immensely to childhood nutrition. Epidemiologic studies have found that preschool experiences have the potential to significantly determine children's weight (Maher, Li, Carter, & Johnson, 2008). This paper attempts to better understand the role that early non-parental group care environments have on influencing preschoolers' nutrition and developing data-driven best practices for nutrition in child care programs.

U.S. Nutrition Policy for Early Childhood Settings

In the U.S., every child care program serving children must be licensed or regulated and, thus, comply with the nutrition standards set by their state licensing regulations, which vary widely from state to state and at best often meet very minimum nutritional standards (Story et al., 2006). Story et al. (2006) reported that in a national study of child care programs, 50% served lunches that had more than 35% of the calories from fat and an average of 13% of the calories from all meals were from saturated fat, over and beyond the United States' Department of Health and Agriculture's recommended *Dietary Guidelines*. In addition to excess fat, this study also found that minimal amounts of fruits and vegetables were served. They found that only "ten states limit foods and beverages of low nutritional value" (Story et al., 2006, p. 159). Moreover, recent statistics in the United States indicate that young children consume enormous amounts of sugar particularly in the form of drinks. More specifically, it is estimated that 44% of young children between the ages of 19 to 24 months drink a sugar-laden beverage daily, and 70% of 2 to 5 year olds consume similar amounts as well (Wang, Bleich, & Gortmaker, 2008). This is problematic because soda and other sugary drinks replace healthier food items that provide vital nutrients such as calcium, iron, and vitamin A, in a developing child's diet resulting in poorer quality of overall diet. As a result, there should be policies in place to ban sugary drinks in child care programs; however, as will be discussed later, the policy monitoring beverages in pre-elementary schools is minimal at best.

It is important to note the child care programs that participated in the study (Story et al., 2006) were all center based and were required to follow the same meal patterns that both the National Association for the Education of Young Children and the California state licensing standards mandate. In a nutshell, this study found that there is no uniform policy regulating the nutritional standards of non-parental group care settings for young children in the U. S. and the research available points to mediocre food and beverage quality and overall nutritional practices in early care programs. The section to follow will include a detailed analysis of the California state licensing requirements as an example of what states require for nutrition policies in child care programs. A similar analysis could be replicated for any state child care licensing requirements to gain a better understanding of how state policies are fostering healthy nutritional practices in child care centers across the nation.

Document Analysis

The State of California Community Care Licensing

The California Department of Social Services (CDSS) Community Care Licensing Division licenses approximately 13,000 child care centers, providing care for close to 800,000 children (CDSS, 2012). Child care centers are defined as any child care facility, except "family child care home, in which less than 24-hour per day, non-medical care and supervision are provided to children in a group setting" (State of California, Health and Human Services Agency, and Department of Social Services, 2005, p. 7). All child care centers much obtain a license from the CDSS unless they are exempt from licensure. The *CDSS Community Care Licensing Division Manual of Policies and Procedures* contains regulations adopted by the CDSS, other State Departments affecting CDSS programs, statutes from appropriate codes which govern CDSS programs, and court decisions. The regulations apply to all child care programs regulated by the state of California.

An analysis of the *CDSS Community Care Licensing Division Manual of Policies and Procedures* revealed that while there are licensing regulations with detailed specifications regarding the storage of breast milk, the sanitation of food, requirements for food components and serving size based on the U.S. Department of Agriculture (USDA) Child Care Food Program and Code of Federal Regulations standards; there is not a single guideline offered regarding how children or teachers should be educated about nutrition. This indicates a big gap in the field in regards to teaching training practices that are affiliated with instilling healthy eating habits in children (**see Table 1**). This study highlights the often overlooked or miniscule role that nutrition plays in the overall assessment of quality of a child care program.

The National Association for the Education of Young Children Accreditation Regulations

A much more rigorous regulatory system to maintain quality assurance nationwide is offered by the National Association for the Education of Young Children (NAEYC). The NAEYC is the world's largest and most widely recognized organization advocating for young children from birth to age eight (Surr, 2004). The NAEYC first began to accredit child care programs in 1985, basing its criteria on current empirical research, setting the bar high for child care programs. In 2006, the NAEYC accreditation standards were reviewed and a much more rigorous,

Table 1. State of California Child Care Regulations Pertaining to Nutrition

1012227	**Food service**
1012227.a.1	All food shall be safe and of the quality and in the quantity necessary to meet the needs of the children. Each meal shall include, at a minimum, the amount of food components as specified by Title 7, Code of Federal Regulations. All food shall be selected, stored, prepared and served in a safe and healthful manner.
1012227.2	Where all food is provided by the center, arrangements shall be made so that each child has available at least three meals per day. Not more than 15 hours shall elapse between the third meal of one day and first meal of the following day.
1012227.3	Where meal service within a center is elective, arrangements shall be made to ensure availability of a daily food intake meeting the requirements of (a) (1) above for all children who elect meal service in their admission agreement.
1012227.4	Between meals, snacks shall be available for all children unless the food a child may eat is limited by dietary restrictions prescribed by a physician. Each snack shall include at least one serving from each of two or more of the four major food groups.
102227.5	The following shall be offered daily: (A) Full-day programs shall offer a midmorning and midafternoon snack. (B) Full-day programs shall ensure that each child has a lunch. 1. The child's authorized representative may send meals and/or snacks for the child. (C) Half-day programs shall offer a midmorning or midafternoon snack.
102227.6	Menus shall be in writing and shall be posted at least one week in advance in an area accessible for review by the child's authorized representative. Copies of the menus as served shall be dated and kept on file for at least 30 days. Menus shall be made available for review by the child's authorized representative and the Department upon request.
102227.7	Modified diets prescribed by a child's physician as a medical necessity shall be provided.
102227.10	Powdered milk shall not be used as a beverage but shall be allowed in cooking and baking. Raw milk, as defined in Division 15 of the California Food and Agricultural Code, shall not be used. Milk shall be pasteurized.

*State of California, Health and Human Services Agency, Department of Social Services (1998, November 1). Manual of policies and procedures, community care licensing division: child care center (Manual Letter NO. CCL-98-11). Retrieved from http://www.cdss.ca.gov/ord/entres/getinfo/pdf/ccc.pdf

comprehensive, and research-based NAEYC Early Childhood Program Standards and Accreditation Criteria took effect. The new standards include 417 criteria within 10 standards. After a comprehensive document analysis of the NAEYC accreditation criteria (including all sub-criteria) that are used to assess child care quality, analysis revealed that 10 out of NAEYC's 417 criteria are devoted to nutrition and the establishment of healthy eating habits for young children (Ritchie, 2006). These 10 criteria were spread among four out of the ten accreditation standards. These four accreditation standards were Standard 1 Relationships; Standard 2 Curriculum; Standard 3 Teaching; and Standard 5 Health.

While it is encouraging to read about these data driven standards that regulate nutrition practices at NAEYC accredited child care programs, it is also important to note that NAEYC Accreditation is a voluntary process and is not mandatory. As a result, only 8% of all child care in the United States programs are accredited by the NAEYC (Surr, 2004). Furthermore, in comparison to other nutrition regulations such as state licensing, NAEYC criteria—while only comprising 2% of their total pool of standards—are often more rigorous (**see Table 2**).

Nutritional Practice Recommendations for Child Care Programs

The Menu

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Table 2. NAEYC Accreditation Standards and Criteria Pertaining to Nutrition

Standard 1.B.	**Building Positive Relationships between Teachers and Children**
Standard 1.B.10	Teaching staff never use threats or derogatory remarks and neither withhold nor threaten to withhold food as a form of discipline.
Standard 5.A.	**Promoting and Protecting Children's Health and Controlling Infectious Disease**
Standard 5.A.02	Unless the program participates in the United States Department of Agriculture's Child and Adult Care Food Program, at least two times a year a registered dietitian or pediatric public health nutritionist evaluates the menus for nutritional content; portion sizes; nationally recommended limits on juice, sugar, sodium, and saturated fats; food service operations; special feeding needs to be met by the program; and procedures used for food brought from home.
Standard 5.B.	**Ensuring Children's Nutritional Well-being**
Standard 5.B.01	If the program provides food for meals and snacks, the food is prepared, served and stored in accordance with the United States Department of Agriculture (USDA) Child and Adult Care food Program (CACFP) guidelines.
Standard 5.B.06	Clean sanitary drinking water is made available to children throughout the day. (Infants who are fed only human milk do not need to be offered water).
Standard 5.B.11	Teaching staff do not offer solid foods and fruit juices to infants younger than six months of age, unless that practice is recommended by the child's health care provider and approved by families. Sweetened beverages are avoided. If juice (only 100% fruit juice is recommended is served, the amount is limited to no more than four ounces per child daily.
Standard 5.B.13	The program does not feed cow's milk to infants younger than 12 months, and it serves only whole milk to children of ages 12 months to 24 months.
Standard 5.B.16	The program serves meals and snacks at regularly established times. Meals and snacks are at least two hours apart but not more than three hours apart.
Standard 2.K.	**Curriculum Content Area for Cognitive Development: Health and Safety**
Standard 2.K.01	Children are provided varied opportunities and materials that encourage good health practices such as serving and feeding themselves, rest, good nutrition, exercise, hand washing, and tooth brushing.
Standard 2.K.02	Children are provided varied opportunities and materials to help them learn about nutrition, including identifying sources of food, recognizing, preparing, eating, and valuing healthy foods.
Standard 3.D.	**Using Time, Grouping and Routines to Achieve learning Goals**
Standard 3.D.07	At snack times, teaching staff sit and eat with children and engage them in conversation. When provided meals are served family style, and teaching staff sit and eat with children and engage them in conversation.

*Ritchie, S. (Ed.). (2006). A Guide to the NAEYC Early Childhood Program Standard and Related Accreditation Criteria. Washington, DC: National Association for the Education of Young Children.

non-parental group care, childcare program practice need to share in the responsibility of helping to create healthy eating habits for young children and ensure that children get the nutrition they need. However, as this paper has revealed the majority of child care programs are still struggling to acknowledge the importance of nutrition and nutrition standards.

To begin with, child care programs should give children repeated opportunities to sample healthy new foods (foods that are high in fiber, calcium, and iron-rich, and low in sodium and sugar) in positive contexts so that some of the foods offered will become preferred and accepted. The importance of exposure to new foods and how repeated exposure can alter initial rejection to acceptance underscores the critical role that childcare providers play in choosing the foods presented to children. For instance, when our school revamped its nutrition standards, one early childhood classroom teacher when asked what she learned about nutrition based on the school's nutrition program, attested to this stating, "It has reinforced the idea, for me, that often times it just takes multiple exposures and peer or adult modeling to encourage children to try new things," (T. Hayes, personal communication, June 8, 2017) Another teacher when asked, if the new lunch and snack menus at our school changed their personal eating habits responded; "Yes, actually they have, and I have even tried to make a few things that I have seen here at school!" (J. Graham, personal communication, May 31, 2017). An administrator from our school agreed stating, "I have been exposed to new foods that I did not know I would like and have now included as part of my diet such as tofu," (G. Lopez, personal communication, May 21, 2017). Another administrator while she did not express a change in her diet per se, remarked, "The lunches have not changed what I know, but have validated that children can enjoy a variety of healthy food including lettuce and spinach" (T. Hayes, personal communication, June 8, 2017). Often times, parents have inquired about specific recipes because they want to provide the same type of food at home. As one parent stated, "I love that the lunches and snacks are made from wholesome, non-processed ingredients without artificial colors and flavors. It makes me happy to see children eating healthy food because it gives them balanced and sustained energy," (J. Graham, personal communication, May, 31, 2016). This has also appeared to be true for the children as well. Appreciation for new healthy food choices was also seen in the children's responses. As one 5-year-old, when asked what they liked about the nutritious lunches, stated, "Well, I like that every day we get to have surprising foods and sometimes we get to have new foods. Snack is really good because when you dip the polenta in the polenta sauce, it's really good," (J. Graham, personal communication, May 31, 2017).

Moreover, an often unnoticed but critical element of a child care program's menu is the beverages that are served at mealtimes and throughout the day. This paper recommends that early child care programs take the nutritional content one step above and beyond California State licensing and NAEYC accreditation standards and create policies that refrain from serving children any form of juice throughout the day and rather offer children milk or water and when available, fresh whole fruit instead of juice.

The Mealtime Experience

In consideration of the associative learning process, child care programs should aim to create a positive atmosphere while offering healthy snack choices. Acknowledging that mealtimes are a social occasion for children, child care programs should offer snack and lunch in a pleasant, aesthetically pleasing context. While children in group care spend their days amongst one another, rarely do they gather together for a shared purpose. Family style dining is an exception to that. This way of dining, where a group of children come together to eat a shared meal, often tends to be a more culturally accurate representation of how people eat and therefore a very valid way to approach mealtimes in group care settings. It is recommended that children as soon as they are able to get into and out of a chair on their own are invited to sit at the table together. Should children over or under serve themselves, caregivers should be seated with them and help scaffold the process. If there is only one bowl of a particular food available, hence, children practice waiting with adult guidance as well as learn to pass the bowl to their peers when they are done serving themselves. Among other things, this particular practice allows children to practice their emerging abilities of perspective taking (American Academy of Pediatrics & American Public Health Association, 2011).

Programs should pay close attention to the context in which food is presented to children. The mealtime experience should mimic a collective, family dining experience more than an individualized, cafeteria atmosphere. Consequently, program policy should encourage family style dining and pay close attention to the context in which food is presented to children.

Staff Training

To support the development of healthy eating habits for children, early child care programs should give staff regular and consistent training on research based best practices for caregiver interactions and nutritional content. For example, programs should aim to give young children repeated opportunities to sample healthy foods in a positive, non-coercive context. When adults coerce children to eat a food and as a result receive a tangible reward, children are less prone to like that food later. For instance, if an adult encourages a child to eat their carrots and if they do so they will get a sticker. Accordingly, asking a child to eat other food first can create a coercive or negative context, which can then influence the child to dislike foods. Thus, while caregivers should monitor the foods that the children are served, it is important to note they should not choose the order in which the children eat them.

As cited previously, research has found that "imposing stringent controls can increase preferences for high-fat, energy-dense foods, perhaps causing children's normal internal cues to self-regulate hunger and satiety to become unbalanced" (Gortmaker et al., 2006, p. 171). Whereas early childhood program best practices should allow caregivers to have clearly defined roles in offering food to the children while allowing the child to maintain the responsibility for deciding what and how much they would like to eat. A child, for instance may want repeated servings of rice but a caregiver may intervene and bring to attention to the fact that they have other choices on their plate as well. Caregivers should strive to strike a balance between controlling the foods that are offered to children while allowing children to choose which foods and how

much they want to taste. In terms of lessons learned from implementing such practices, one teacher aptly stated, "Something that I am more cognizant of now is serving portions. I was raised to eat everything on my plate. Another thing that I have learned is to have smaller meals every three hours just like the children" (G. Lopez, personal conversation, May 31, 2017).

Finally, just as it is important for caregivers to be trained on and know the importance of healthy nutrition, it is important for early childhood pedagogical practices to include conversations with children about the importance of establishing healthy eating practices so that children understand what it means to be healthy and how food relates to health. The following children all articulated their understanding of healthy eating habits:

"Healthy means that if you eat like broccoli and carrots and salmon and healthy stuff you can grow and grow and grow and then you can be mom and dads and then you can go on scary rides and watch scary movies and stuff. It means you can't get cavities." (4-year old)

"I know a lot about junk food. Junk food is like all candy. When you eat too much candy you get sick and you get a fever because if you get a fever you don't feel good and you don't get to go to school." (5-year-old)

"I think healthy means like eating stuff that's good for your body. Foods that is healthy for you is good for your body and makes you get bigger." (4-year-old)

Making solid foundational links between food and health early on will go a long way in establishing healthy eating habits at an early age and help children develop into adults that make—at the very least—informed decisions about the foods they choose to consume.

Conclusion

Early childhood programs need to heighten their focus on instilling healthy eating habits in young children. Subsequently, it is recommended that early child care programs add the aforementioned systemic data driven measures regarding children's access to high quality nutrition in the form of menu specifications, the mealtime environment and staff training on interactions and nutritional content to ensure that children are served healthy, nutritious food and beverages during their time in group care. Good nutrition in school improves a child's learning ability and overall welfare and, ultimately, determines the nutritional trajectory for a child's lifetime.

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