

# Using the RE-AIM Framework in Formative Evaluation of the EAT Family Style Multilevel Intervention

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## Research article

**Keywords:** Responsive Feeding, Early Care and Education, Implementation Science

**Posted Date:** October 9th, 2020

**DOI:** <https://doi.org/10.21203/rs.3.rs-87491/v1>

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# Abstract

**Background** Ecological Approach To (EAT) Family Style is a 16-week responsive feeding Early Care and Education (ECE) intervention, utilizing a multilevel improvement system of 4 implementation strategies: (a) provision of a 7-lesson, on-line professional development training for administrators and teachers (b) administrative support; (c) performance monitoring, feedback, and assistance through follow-up coaching; and (d) use of incentives. The 7 lessons cover role modeling, peer modeling, sensory exploration, self-regulation, children serve themselves, praise and rewards, and family engagement, each relying on goal setting. The evidence-based practices and implementation system was delivered to ECE administrators and teachers completing one online lesson/week followed by a coaching session with a trained coach. EAT Family Style is guided by the self-determination theory. The objective of this study was to evaluate the EAT Family Style intervention through the Reach, Effectiveness, Adoption, Implementation, and Maintenance (RE-AIM) framework.

**Methods** Center-based ECE administrators (n=8) and teachers (n=17) caring for preschool (3-5 years) children and coaches (n=9) who participated in the EAT Family Style intervention were recruited. Semi-structured interviews were conducted, transcribed verbatim, and coded deductively by 3 coders using RE-AIM dimensions as a priori codes and placed into themes and sub-themes using thematic analysis.

**Results** All participants perceived that EAT Family Style improved children's nutritional and developmental outcomes and encouraged a positive mealtime environment (Effectiveness). Coaches and administrators reported EAT Family Style aligned with their professional goals and beliefs. Coaches found professional development incentives important, whereas administrators/teachers specifically valued in-service training credit hours (Adoption). Teachers reported successful implementation of EAT Family Style practices in the classroom. Administrators and coaches supported the teachers through administrative and coaching strategies (Implementation). All participants reported they intended to continue using the intervention. Administrators and teachers discussed incorporating EAT Family Style practices into handbook/school policy (Maintenance).

**Conclusion(s)** EAT Family Style was viewed as feasible by participants. Its 4-pronged implementation strategy has the potential to improve the uptake of evidence-informed feeding practices in ECEs.

## Background

Childhood obesity is a serious global public health issue given its presumed short and long-term adverse consequences on children's physical and mental health (1). In 2016, the prevalence of childhood obesity was 14% for children ages 2–5 (2). Research has shown that childhood obesity often tracks into adolescence and adulthood, which increases risk for chronic disease later in life (3–5). Thus, improving children's dietary intake has become a target for childhood obesity prevention interventions. Early Care and Education (ECEs) centers offer an ideal opportunity for these interventions given the amount of time children spend in this setting. In the United States, 60% of children aged 2–5 attended some form of non-

parental care, and these children spent an average of 33 hours a week in ECEs and consumed up to 5 meals and snacks each day (6). Young children, specifically from low-income families have poor dietary quality and fail to meet age-specific dietary recommendations, underscoring the role of ECEs for improving children's dietary intake (7).

USDA's Child and Adult Care Food Program (CACFP) provides reimbursement to ECEs serving children from low income families to ensure children have access to nutritious meals and snacks. CACFP requires participating ECEs to meet specific meal patterns to qualify for reimbursement. These meal patterns include serving whole grains, fruits and vegetables, meat and meat alternatives and low-fat milk. The required amounts to be served vary by meal and age group of children (8). In addition, CACFP also recommends participating ECEs utilize best practices for offering nutritious foods such as the use of role modeling and allowing children to serve themselves to self-regulate their intake (9, 10). Participation in CACFP has been related to improved availability of nutritious foods in ECEs. For example, Liu et al. (11) found that ECEs participating in CACFP were more likely to serve whole grain options daily than non-CACFP sites. Additionally, Richie et al. (12) found that CACFP participating ECEs were more likely to serve more milk, fruits, vegetables, and meat or meat alternatives and less sweetened beverages than non-CACFP sites..

Although research shows that CACFP ensures availability of nutritious meals and snacks in participating ECEs, there is limited evidence whether children consume these nutritious foods or if CACFP guidance influences children's dietary intake. For instance, Hasnin et al. (13) found that even though CACFP participation improved availability of nutritious foods, children were not meeting dietary recommendations. Specifically, for both 3- and 4-5-year-old children, mean consumption of grains, fruits and vegetables was significantly lower than the Dietary Guidelines for Americans recommendations, with more than 75% of children not meeting recommended vegetable consumption. Since availability of healthy foods does not ensure that children's dietary intake meets recommended nutritional standards, additional strategies to feeding young children are warranted. One such approach utilizes evidence-based responsive feeding practices.

Responsive feeding includes evidence-based practices to promote autonomy support and self-regulation thereby encouraging children's healthy mealtimes eating behaviors. For example, Lumeng et al. (14) found that when adult caregivers made positive statements about the foods they were eating, children were more likely to try the foods, confirming earlier findings that when teachers enthusiastically role modeled eating foods, children were more likely to try the same new foods (15). Similarly, there is evidence for other responsive feeding practices such as repeated exposure (16), peer modeling (17), engaging children's senses (18–20), cueing children to their internal signals of hunger and fullness (21–23), using praise effectively (24), engaging families (25, 26) and allowing children to serve themselves (27–29) as strategies for improving children's dietary intake and supporting children's self-regulation in eating. Further, the Institute of Medicine (30), Academy of Nutrition and Dietetics (31), and CACFP (9) also recommend that ECE professionals implement these responsive feeding practices.

Despite being evidence-based and recommended, implementation of responsive feeding in ECE is sub-optimal. For instance, in Nebraska, Dev, Garcia, Dzewaltowski et al. (32) found that only 50% ECE teachers ate the same foods and beverages as children at meals and less than 43% ECEs served meals family style. In Minnesota and Wisconsin, approximately 32% of ECEs reported using food as rewards and punishment, and only 51% have at least one adult sit at the table and eat the same food served to the children (33). Similarly, in Illinois, only 34% of CACFP participating ECEs were found to serve meals family style, 33% did not always eat the same foods served to children, and 27% of teachers did not always sit with children during meals (34).

Sub-optimal use of responsive feeding EBPs can be attributed to implementation challenges reported at multiple levels within the ECE setting: the administrative level; classroom or teacher-level; and child-level. Challenges for supporting implementation of responsive feeding EBPs at the administrative level include expectations for teachers to perform other classroom duties during mealtimes (35); need for additional resources (such as providing meals for teachers to be able to eat together with children (32, 35, 36) and additional serving utensils needed for family style meal service (37); misconceptions regarding CACFP reimbursement (37, 38); concerns about plate-waste; and fear of negative parental reaction if children don't eat enough in the ECE (39, 40). At the ECE classroom-level, teachers have reported family style meal service is messy, unhygienic, and time consuming (37); have misconceptions children may overserve or not eat enough (37, 38); and personal taste preferences for not eating the same foods served to the children (35, 39). At the child-level, teachers have reported challenges related to children's food refusal (41); child taste preferences (33, 39); and use of more controlling feeding practices when children refuse food (42).

Systematic reviews of previous obesity prevention interventions in ECE settings recommend a multilevel approach for improving children's dietary intake (43, 44). However, there is a lack of ECE interventions that simultaneously target both ECE administrator and teacher-level challenges. Further, many ECE interventions facilitate behavior change through a centralized diffusion model, where the expertise and content control rests with the research team, diffusion flows in a top-down manner and the intervention is delivered either at the ECE administrator or teacher-level (43, 44). An alternative to this centralized top-down model is a decentralized diffusion delivery model (45), where the research team targets building autonomy control and competence capacity (46) of others through a multilevel intervention model. In addition to improving intrinsic motivation (46), such community building participatory approaches may have widespread reach as they can be adapted and implemented by the communities and ECEs with limited reliance on an outside research team.

The Ecological Approach to Family Style Dining (EAT Family Style) was developed to address the need to increase implementation of responsive feeding EBPs within ECE settings, taking into consideration previously reported challenges. EAT Family Style is a multilevel intervention model that integrates change at the individual-level (e.g. attitudes and beliefs), intrapersonal level, (e.g. administrators and teachers) and organizational level (e.g. ECE policies and mealtime practices). As such, the intervention engaged three cohorts of participants: administrators, classroom teachers and coaches. In addition, building

capacity of ECEs to apply responsive feeding EBPs was ensured by utilizing a package of four evidence-based implementation strategies including professional development, administrative support, coaching and use of incentives. These were selected from past studies showing enhanced implementation and adoption (47, 48).

In this article, we present the formative evaluation of the EAT Family Style multilevel implementation model, using the RE-AIM frameworks' five evaluative dimensions – reach, efficacy, adoption, implementation, and maintenance. RE-AIM framework was utilized due to its compatibility with the systems and socio-ecological approach taken, which are focused on public health and community-based interventions (49, 50). Formative evaluation of programming is essential to determine feasibility of future expansion.

## **Methods**

This qualitative study used in-depth interviews to better understand the coaches, ECE administrator and teacher perspectives and experiences regarding their participation in the EAT Family Style intervention. The one-on-one interview sessions offered participants the opportunity to openly discuss their thoughts while the interviewer probed to follow-up on their responses about their involvement in the program. This approach allowed for interpretations drawn from the rich descriptions of the individual perspectives about the EAT Family Style and exploration of overlapping ideas and nuances in the participants' experiences across multiple levels.

### **Sampling**

A purposive sampling criterion was used to recruit participants for this study. Participants for the qualitative interviews were coaches, ECE administrators and teachers, who had completed the EAT Family Style program in Nebraska in 2018. Specifically, coaches were Cooperative Extension and community educators who have extensive experience working with ECE settings, whereas ECE administrators and teachers were recruited from center-based ECEs through EAT Family Style program eligibility criteria. To be eligible for the EAT Family Style program, ECEs had to meet the following eligibility criteria: a center-based ECE program, participating in CACFP, caring for preschool-aged children (3-5-year-old), and provide the lunch-time meal to the attending children. Teachers who participated in the ECE program had to meet the additional eligibility criteria of caring for 3-5-year-old preschool children in the classroom, present with children during the lunch time meal, and over the age of 19 years. All participants who completed the EAT Family Style intervention were contacted for a follow-up interview, agreed to participate and provided written consent.

### **The EAT Family Style Intervention**

The purpose of the EAT Family Style intervention is to improve children's dietary intake through the implementation of responsive feeding EBPs within ECE. The EAT Family Style intervention was developed as a hybrid distance learning program (i.e. combination of face-to-face and online learning), as web-based program with seven lessons including short videos, interactive assessments and mealtime

scenarios guided goal setting (51) and online one-on-one coaching. This hybrid approach was intended to extend reach to rural ECEs.

**Web-based online lessons.** The program presented responsive feeding EBPs to teachers and administrators through a series of seven online lessons: 1) Role Modeling; 2) Peer Modeling 3) Sensory Exploration; 4) Self-Regulation; 5) Children Serve Themselves; 6) Praise and Rewards; and 7) Family Engagement (Table 1). Each lesson described the benefits of implementing each responsive feeding EBP (motivators), identified and illustrated responsive feeding EBPs and strategies and addressed personal and contextual challenges towards their implementation. The videos (n = 66) were developed using a five-step procedure: conduct a needs assessment; identify EBPs; render EBPs into video scripts; seek feedback; and record and edit videos (Dev et al., 2018). The video content followed Ramsay et al.'s (53) key characteristics for effective videos for ECEs: (1) use real scenarios; (2) provide short segments; (3) present simple, single messages; (4) convey a skill-in-action; (5) develop the videos so participants can relate to their settings; and (6) support participants' ability to conceptualize the information.

Table 1

Core Components of Ecological Approach To (EAT) Family Style Multilevel Intervention, Relationship to Self-Determination Theory, Operational definition or responsive feeding practices, and the supporting evidence

Component	Conceptual or theoretical definition related to Self-determination theory (Deci and Ryan, 2008)	Operational definition or responsive feeding practice  Teacher-level	Outcomes  Child-Level	References	Type of Evidence
<b>Role Modeling</b>	Social factors like actions and language used by social agents (peers and teachers) impact intrinsic motivation  Supporting children's autonomy includes providing rationale and explanation for behavioral requests	Sit with children  Eat meals together with children  Enthusiastically role model  Specific verbal comments  Educate children about the nutritional quality and benefits of eating healthy foods	Children are more likely to try new foods and eat healthy foods served  Increases new food acceptance and liking of food	14  15, 31	Quasi-experimental, systematic review, Academy of Nutrition and Dietetics benchmarks
<b>Peer Modeling</b>	Social factors like actions and language used by social agents (peers and teachers) impact intrinsic motivation	Teach peers to positively role model eating healthy foods  Teach children to refuse food politely	Increases new food consumption	15, 17	Quasi-experimental

Component	Conceptual or theoretical definition related to Self-determination theory (Deci and Ryan, 2008)	Operational definition or responsive feeding practice  Teacher-level	Outcomes  Child-Level	References	Type of Evidence
<b>Sensory Exploration</b>	Supporting children's autonomy includes providing rationale and explanation for behavioral requests	Engage children's senses by describing and asking questions about the sensory characteristics of food  Engage children's senses through hands on activities with foods	Increase children's willingness to try new foods  Increases preferences for healthy foods	18–20	Randomized control trials, quasi experimental, pre-post comparison intervention studies

Component	Conceptual or theoretical definition related to Self-determination theory (Deci and Ryan, 2008)	Operational definition or responsive feeding practice  Teacher-level	Outcomes  Child-Level	References	Type of Evidence
<b>Supporting Self-regulation</b>	Autonomy support includes recognizing the feelings and perspectives of the child and allowing them to make their own decisions and minimizing controlling techniques	<p>Set mealtime structure and routines with clear expectations regarding what, when, and where children should eat.</p> <p>Help children recognize their internal hunger and satiety cues and respect children's</p> <p>hunger and satiety cues once expressed</p> <p>Model feelings of hunger and satiety</p> <p>Avoid controlling feeding practices such as pressuring children to eat, offering food as a reward, and praising children for finishing their food</p>	Prevents overeating in children	21–22	<p>Longitudinal cohort, randomized control trial, Academy of Nutrition and Dietetics Benchmarks</p> <p>Head Start guidelines</p>

Component	Conceptual or theoretical definition related to Self-determination theory (Deci and Ryan, 2008)	Operational definition or responsive feeding practice  Teacher-level	Outcomes  Child-Level	References	Type of Evidence
<b>Allowing Children to Serve themselves</b>	<p>The perception of having a choice increases the sensation of personal control, autonomy, and the intrinsic motivation to carry out an activity</p> <p>Build competence by teaching children how to serve themselves</p>	<p>Provide guided choices where children decide what and how much to eat from the foods offered.</p> <p>Foods and beverages are placed in common serving containers and children serve themselves what and how much they would like to eat</p>	<p>Supports children’s ability to self-regulate</p> <p>Improves young children’s independence, eye-hand coordination and self-esteem</p> <p>Increases new food acceptance</p>	<p>22</p> <p>27–28</p> <p>29</p>	<p>Quasi experimental, within subjects crossover, qualitative interviews,</p> <p>Academy of Nutrition and Dietetics benchmarks,</p> <p>Head Start guidelines</p>
<b>Using Rewards and Praise Effectively</b>	<p>Use of rewards can decrease children’s intrinsic motivation for trying that food</p>	<p>Use non-food rewards instead of food rewards for good behavior</p> <p>Praise children for trying new or unliked foods – do not praise them for eating already liked foods</p> <p>Praise should be individualized and specific to the child</p>	<p>Food rewards can decrease children’s like of target (healthy) foods and increase liking of food used as a reward</p>	<p>24</p>	<p>Cluster randomized trial</p> <p>Academy of Nutrition, Head Start, National Resource Center for Health and Safety in Child Care and Early Education</p>

Component	Conceptual or theoretical definition related to Self-determination theory (Deci and Ryan, 2008)	Operational definition or responsive feeding practice  Teacher-level	Outcomes  Child-Level	References	Type of Evidence
<b>Family Engagement</b>	Engage with families at the program, classroom, and individual levels  Engage families through two-way communication  Use written policy to communicate with families	Communication can improve home nutrition environment  Improves parent knowledge on nutrition and children’s eating in child care	25  26	Qualitative, mixed methods  The National Association for the Education of Young Children (NAEYC), Head Start, Institute of Medicine	

### The EAT Family Style Multilevel Implementation Model

The *EAT Family Style Multilevel Implementation Model* was established to build the capacity of ECE professionals to implement responsive feeding EBPs (Fig. 1). Modeled upon the *Healthy Places Framework* (54) the EAT Family Style used a decentralized diffusion and participatory community-building approach.

**Participatory Community-Building Iterative Process.** Participants completed the intervention between January 2018 and June 2018. The intervention lasted 16 weeks. ECE administrators and teachers followed a participatory iterative process: complete online lesson and guided goal setting during the first week with coaching the following week, for each of the seven online lessons (Fig. 1). Guided goal setting (51) was used to assist participants in selecting pre-established goals (selected from lesson EBPs and strategies) that resonated with them. At the end of each lesson, participants were shown a list of 8–10 potential goals from which they were instructed to note whether they were a) not yet doing this; b) sometimes doing this; or c) doing this for each potential goal. Then, participants were encouraged to select goals from those they marked as not yet doing or sometimes doing as well as any goal they were doing but found challenging. After participants selected and implemented their weekly goals, they recorded a mealtime where they practiced the strategies from the lesson and met with their assigned coach to discuss progress and challenges encountered.

**Implementation Strategies delivered at the coach, ECE administrator and teacher levels.** To support implementation of responsive feeding EBPs, EAT Family Style used the four implementation strategies

suggested by Bell et al. (47) and Whiteside Mansell et al. (48). The section below outlines the strategies used at each level (coaches, ECE administrators and teachers).

Provision of professional development and resources for coaches, ECE administrators and teachers. Coaches were university employed or Cooperative Extension community educators working at the county-level. For delivering the intervention at the coach-level, the research team offered a one-day training regarding the EAT Family Style intervention and coaching process. All coaches received workbooks. In addition, they attended bi-monthly Zoom meetings with other coaches and the expert research team to ensure fidelity to the intervention and answer any questions. At the ECE administrator and teacher-level the intervention was delivered through web-based lessons and distance coaching. Regarding provision of additional resources, all participating centers also receive EAT Family Style materials: workbooks, policy template, parent handouts in English and Spanish corresponding to each of the seven lessons, Chromebooks (laptops to complete online lessons, meet with coaches through Zoom meetings, and video record mealtimes), and Mi-Fi devices for connecting to Wi-Fi if the ECE teachers requested them.

Securing Administrative Support. ECE administrators were first contacted about their interest and commitment. They signed the written consent form and then contacted their teachers about their interest in participating in the intervention. All administrators were required to participate in the intervention and complete the seven web-based lessons and coaching. For each EAT Family Style lesson the administrator goal sheets were strategically aligned with teachers' goals sheets to maximize opportunities for the administrator to support the teachers for implementing responsive feeding EBPs. Additionally, for each lesson the administrators were encouraged to select goals regarding participating in or observing mealtimes and engaging with teachers during meetings and check-ins to address their challenges so as to support teacher implementation of EBPs in the classroom.

Performance monitoring, feedback, and support through follow-up sessions for coaches, ECE administrators and teachers. To support coaches, a training hub was developed that included the EAT Family Style Expert Research Team and all coaches Meetings were held bi-monthly at which time coaches provided feedback from teachers on their progress and the training modules. Additionally, coaches brought any questions and challenges to the Expert Team where solutions were offered by the hub members. This training hub provided a channel for indirect two-way communication from the EAT Family Style administrators and teachers to the EAT Family Style development team via the coaches.

ECE administrators and teachers individually participated in coaching sessions after each online lesson. Coaches provided monitoring and feedback by discussing participants' success stories and challenges, providing feedback and positive reinforcements, and helping participants plan strategies to overcome challenges and implement selected goals. Coaches also referred to video recordings of teachers at mealtimes to assess whether the goals set by the teachers were met, and then formed individualized feedback to help teachers improve their classroom practices.

Incentives. Incentives were distributed at the coach, ECE administrator and teacher-level. Coaches received free professional development credits for their participation along with a report indicating their

contributions to the EAT Family Style program (e.g. peer reviewing program contents and offering feedback, number of participants they coached and participant testimonials) to include in their Annual Evaluation. At the ECE administrator and teacher-level, a variety of incentives were offered including in-service hours and certificates to meet their annual licensure requirements, \$250 mini-grant towards purchasing supplies, and individual gift certificates valued at \$50 for personal use. Regarding in-service hours, the Nebraska Department of Health and Human Services (DHHS) requires teachers and administrators to complete 12 in-service hours annually to maintain their license (DHHS, 2013). After completing the EAT Family Style program, administrators and teachers received 19 in-service hours (12 hours for competing online lessons and 7 hours for completing coaching sessions).

### **Self-Determination Theory: Theoretical Framework for the Program**

The overall program framework of EAT Family Style is grounded in self-determination theory (SDT) to support capacity building. Briefly, SDT describes *autonomy*, *competence*, and *relatedness* as three essential human needs for ongoing psychological growth, integrity, and well-being (46). Specifically, for the EAT Family Style program at the coach-level, *autonomy* was supported through the community-building participatory process, seeking coaches' feedback for program delivery based on their experience with other ECE interventions. *Competence* for coaches was supported through the training and bi-monthly meetings with the expert research team to answer any questions and address challenges. *Relatedness* with coaches was fostered by offering a respectful and collaborative learning environment during meetings and continuous email and phone support.

At the ECE administrator and teacher level, *autonomy* was supported by allowing them to select goals they would like to achieve and providing rationale behind implementing the EBPs. *Competence* was developed through the provision of training materials and ongoing support and follow-up through coaching. *Relatedness* was supported by encouraging administrators and teachers to work together to implement the EBPs and coaching strategies for establishing rapport, encouraging mutual communication with the teacher and administrator and identifying strategies to address their challenges.

Finally, at the child level, autonomy is supported by ECE teachers' use of responsive feeding EBPs by allowing them to decide what and how much and food they eat at mealtimes, respecting their hunger and fullness cues when expressed, and providing rationale and explanation through role modeling and sensory exploration as an alternative to pressure and coercive control for encouraging children to try different foods and managing food refusal. Competence is supported by having teachers set clear expectations and mealtime structure and routines by cueing children to pay attention to their hunger and fullness signals while guiding them to select their portion sizes and serve themselves at mealtimes. Relatedness is fostered through a relaxed mealtime atmosphere where the teacher sits and engages with children during the meal.

Based on the relationship of SDT model for promoting motivation behind adoption and maintenance of health behaviors (46), we expect that by addressing autonomy, competence, and relatedness in the EAT Family Style program, teachers' motivation to implement responsive feeding EBPs will improve.

## RE-AIM: Theoretical Framework for the Formative Evaluation

RE-AIM focuses on identifying essential elements of interventions and programs that can improve sustainable adoption and implementation. As the ECE setting is a unique environment with many factors influencing daily operation, this framework was specifically selected for its systematic approach to understand organizational and individual factors relating to the EAT Family Style program implementation (49).

### Data Collection

Semi-structured interviews were conducted with coaches, ECE administrators and teachers based upon the RE-AIM dimensions. The interviews were conducted by the lead author who had training and prior experiences in qualitative study. The lead author was a colleague of the coaches however had no hierarchical relationship with them and had no prior relationship with ECE administrators or teachers. For all participants, the lead author explained the purpose and scope of the study, assured confidentiality, and provided each the opportunity to clarify or ask questions prior to conducting the actual interview. All participant responses were deidentified using pseudonyms during data analysis and reporting of results. Initially, all participants who completed EAT Family Style were recruited for interviews; however, data saturation was reached before all participants were interviewed. For this study, data saturation was defined as three consecutive interviews that revealed no new information (56, 57). In total, nine coaches, 8 ECE administrators and 17 teachers completed the interviews. One-on-one interviews were performed through an online communication platform (Zoom version) between May to August 2018. With consent from participants, interviews were video recorded which lasted 45 minutes to an hour to complete. The lead author also prepared field notes summarizing the participant's responses immediately after each interview. The interviews were transcribed verbatim with an integrated transcript from Zoom and checked for accuracy by the authors. All procedures in this research study were submitted to and approved by the XXXXX Institutional Review Board.

### Interview Protocol

Interview questions were informed by previous evaluation studies that used RE-AIM framework (58). In addition, consultation meetings were held with ECE and nutrition experts to collaboratively develop a set of thirteen interview questions. These questions were piloted with 3 teachers who were working fulltime in different ECEs in Nebraska. Findings informed changes in protocol regarding clarifying wording for ease of understanding. Adjustments were also made to accurately capture participants' responses to align with the 5 dimensions of the RE-AIM model. Table 2 summarizes the RE-AIM dimensions with related definitions for evaluating the EAT Family Style intervention, the concept addressed in each dimension and example interview questions.

Table 2

*RE-AIM Definitions, Concepts Addressed, and Example Interview Questions*

Dimension	Definition (49)	Concepts Addressed and Example Interview Questions
Reach	How many and what proportion of the target population participated in the program?	Describes variation in reach: number of participants enrolled and decline rate What are participants' reasons for not participating?
Effectiveness	What outcomes are of value to what stakeholders, and how did the intervention fare on these factors? What was the impact of the program / intervention on important outcomes? What was the most important benefits achieved?	Identify outcomes valuable to stakeholders, and the impact of the program on these outcomes. How did EAT Family Style impact children's mealtime behavior (e.g. serving themselves, engagement)? Did you observe children's behavior in response to the program? How do you think some of the children responded to some of the strategies?
Adoption	Why organizations (and staff and members in each organization) choose to participate or not in the intervention?	Factors influencing decision to participate or not for implementation support team (coaches), organization (ECE administrators), and staff (ECE teachers). What made you participate? Which program incentive was most valuable to you?
Implementation	How are the different components of the program delivered?	Program delivery through EAT Family Style implementation strategies. How are the lessons applied?

How did the goal sheets and technology work for you? (e.g., Chromebook, Zoom, video recordings)

What things did not work for you? How were they addressed in real time?

What aspects in the program did you like? What made you say so?

Maintenance      Why the organizations delivering the intervention decides to continue or discontinue the intervention for future program design?

Motivations for intending to continue using program practices and strategies. What kind of changes do you plan to continue in your program?

What are some incentives we can give to (participants) that will encourage them to continue implementing this program?

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## Data Analysis

All interview transcripts were imported into NVivo 9 to facilitate data analysis. Data was coded deductively and inductively through thematic analysis (59). Data for coaches, ECE administrators and teachers were analyzed separately through the following process. First, three authors familiarized themselves with the data by thoroughly reading transcripts until the content was familiar and themes had begun to emerge. Second, initial codes were generated *a priori* with the RE-AIM dimensions. Additional codes were developed inductively by identifying units of meaning, and descriptive codes emerged. Third, codes were grouped into clusters of potential themes and subthemes. Fourth, themes and subthemes were compared by each coder and reviewed for consistency to ensure they were representative of the data. Fifth, themes were refined and named with coders agreeing on the definitions of each through verbal consensus. Sixth, tables were produced for the final report and overarching themes for coaches, ECE administrators and teachers were discussed and agreed upon. Throughout this process the lead author monitored researchers' biases through peer consultations and frequent team meetings to ensure that results were accurately represented based on participant responses. Additionally, authors who did not code the transcripts verified that the themes were supported by the codes and quotations (60).

## Results

Majority of the participants were white, with a mean age of 42 ( $\pm$ ) y, 45( $\pm$ ) y for ECE administrators, and 35 ( $\pm$ ) y (for coaches, ECE administrators and teachers, respectively. Almost 90% coaches had at least an MA degree, 62% of ECE administrators had BA degree, and 47% of teachers had some college experience. Most coaches and ECE administrators had > 15 years of experience working in ECE programs, whereas 35% of teachers had 1–2 years. Complete participant demographic information is outlined in Table 3.

Table 3

Dimension	Definition (49)	Concepts Addressed and Example Interview Questions
Reach	How many and what proportion of the target population participated in the program?	<p>Describes variation in reach: number of participants enrolled and decline rate</p> <p>What are participants' reasons for not participating?</p>
Effectiveness	<p>What outcomes are of value to what stakeholders, and how did the intervention fare on these factors?</p> <p>What was the impact of the program / intervention on important outcomes? What was the most important benefits achieved?</p>	<p>Identify outcomes valuable to stakeholders, and the impact of the program on these outcomes.</p> <p>How did EAT Family Style impact children's mealtime behavior (e.g. serving themselves, engagement)?</p> <p>Did you observe children's behavior in response to the program? How do you think some of the children responded to some of the strategies?</p>
Adoption	Why organizations (and staff and members in each organization) choose to participate or not in the intervention?	<p>Factors influencing decision to participate or not for implementation support team (coaches), organization (ECE administrators), and staff (ECE teachers).</p> <p>What made you participate?</p> <p>Which program incentive was most valuable to you?</p>
Implementation	How are the different components of the program delivered?	<p>Program delivery through EAT Family Style implementation strategies.</p> <p>How are the lessons applied?</p> <p>How did the goal sheets and technology work for you? (e.g., Chromebook, Zoom, video recordings)</p> <p>What things did not work for you? How were they addressed in real time?</p> <p>What aspects in the program did you like? What made you say so?</p>

*Demographic characteristics of Ecological Approach To (EAT) Family Style multilevel intervention participants*

Dimension	Definition (49)	Concepts Addressed and Example Interview Questions
Maintenance	Why the organizations delivering the intervention decides to continue or discontinue the intervention for future program design?	<p>Motivations for intending to continue using program practices and strategies.</p> <p>What kind of changes do you plan to continue in your program?</p> <p>What are some incentives we can give to (participants) that will encourage them to continue implementing this program?</p>
<i>Demographic characteristics of Ecological Approach To (EAT) Family Style multilevel intervention participants</i>		

**Reach** assesses whether EAT Family Style is addressing its target population. To measure this, we included the number and percentage of eligible 3-5-year-old children enrolled in EAT Family Style sites, compared to those who were eligible but decided not to participate. Across EAT Family Style targeted sites, a total of 282 children were eligible to participate in the program. Out of this, 251 3-5-year-old children initially participated with a 14% attrition rate. Reasons for non-participation and decline in number of participants include children on special diet, parents not providing consent for their children to be video recorded, and ECEs dropping out in the program. Overall, 77% of 3-5-year-old children (n = 216) from our targeted CACFP ECEs in Nebraska participated in EAT Family Style intervention in 2018.

**Effectiveness** identifies how the program influenced positive children’s outcome and the overall mealtime context as highlighted by the descriptions that coaches, ECE administrators and teachers provided.

Child-level. EAT Family Style responsive feeding practices improved children’s dietary outcomes.

Teachers described how their use of EAT Family Style responsive feeding practices improved children’s eating behaviors at mealtimes, such as trying new foods and increased intake of healthier foods. For example, they mentioned that practicing food-based sensory exploration with children encouraged them to eat vegetables, while role modeling encouraged children to try new foods. Teachers also reported that since using EAT Family style responsive feeding practices at mealtimes, children feel less intimidated to taste food they do not like. Specifically, peer modeling raised children’s willingness to try different fruits and vegetables especially picky eaters. Many of them also shared that several of their picky eaters benefit from watching their peers eat the served food and are now slowly trying variety of foods at mealtimes:

*“I have a couple of children that can be picky eaters. And I think because they were listening to the other kids say that the food was good because it tasted sweet or they started playing a game where they pick up a piece of fruit, put it on their fork and hold it up and they’d say, “Whoever has cantaloupe, hold it up,” and then they all take a bite together. And so that kind of got some of them involved doing that with fruits and vegetables too.”*

Similarly, ECE administrators and coaches noticed children learning to cue feelings of fullness by using sensory words like “full bucket” or “water filled to the brim of cup.” In addition, they also observed children decide what food to eat and consume more of the food offered since they started using different EAT Family Style responsive feeding strategies in the classroom.

Child-level. EAT Family Style responsive feeding practices supported children’s healthful development (i.e. skills for communication, socialization, and autonomy).

Stakeholders described different ways responsive feeding EBPs supported children’s developing communication and social skills. They also reported how responsive feeding EBPs helped children become more engaged in their mealtime interactions with peers, and improved skills for serving themselves. For instance, one teacher shared that practicing EAT Family Style during lunch helped her students become more independent and notably improved their fine motor skills in pouring liquids or scooping food. In addition, teachers also observed changes in students’ mealtime interactions - with children having more interesting and pleasant conversations with their peers. They also mentioned that they observed children talking more about the food served and relating them to concepts they learned in class (e.g. tortilla cut in half). Similarly, teachers also noticed improvements in children’s communication skills especially their use of polite words during mealtimes. Many of the teachers gave examples how children are getting better expressing themselves politely when refusing the food offered.

They are more polite saying ‘No, thank you,’ instead of ‘Ewww, no, that’s gross’ which I think is very helpful because before when they would say ‘That’s gross,’ and then everyone would say ‘Ewww, no.’ And now they’re just like, ‘No, thank you, I don’t like that.’ So, it’s a lot more polite. They’ll say thank you. So we’re working on that, they do have pretty good manners.

Child-level. EAT Family Style responsive feeding practices promote positive mealtime environment in the classroom.

Stakeholders agreed that using EAT Family Style feeding practices with the children has remarkably improved the overall mealtime environment. Specifically, teachers mentioned how their mealtimes positively changed since practicing EAT Family Style in the classroom. For example, one of the teachers shared that mealtimes with children used to be chaotic but remarkably shifted to a much calmer lunchtime after the EAT Family Style program.

*“I just feel like it goes a lot smoother than it was before. Before it was really crazy. I honestly feel like it goes a lot smoother now and it takes, it takes more time. And so we actually use our entire lunch period and I’m not constantly having to tell everyone to sit back down, or stay at the table because I did that a lot before, but now they stay at the table until everybody’s done eating and then we all help clean up and then by that time, our whole lunch hour’s over and it wasn’t as terrible as it used to be.”*

In addition, teachers also mentioned how EAT Family Style helped younger children practice self-regulation especially those students who used to be restless during mealtimes. They noticed how children learned to slow down and patiently waited for their turn by watching their peers serve themselves.

Teachers also related EAT Family Style feeding practices in the classroom with increased children's intake of healthy food, and noted decrease in food wastage during mealtimes. ECE administrators and coaches also noted the change in the classroom's overall mealtime environment by highlighting how EAT Family Style encouraged cooperation and positive conversations among children. They also described mealtimes in the classrooms to be calmer and less messy, with children looking more relaxed and engaged.

**Adoption** focuses on specific components of the program that stakeholders deemed to be essential in their decision to adopt EAT Family Style in their centers. This section describes factors that influenced participants' decisions to participate in EAT Family Style intervention.

Coach-level. Coaches adopted EAT Family Style because it aligned with their professional beliefs and goals, and promoted opportunities to improve their coaching skills for professional development.

Program coaches reported that they were convinced by the positive outcomes of responsive feeding from previous research, and emphasized that being in the forefront of a quality intervention program such as EAT Family Style primarily motivated them to join. In addition, coaches greatly valued how EAT Family Style provided them the opportunity to grow professionally. They shared that serving as a program coach for both administrators and teachers helped them hone their coaching skills by reflecting on their individual practices.

I'm trying to refine and hone these coaching skills because this is something that I'm really passionate about, and something that I am going to pursue as I move forward with my academic career in grad school. I have really identified coaching as the next step in my career path. So this was just something that really seemed like the right fit for me. Something I have been really interested in, and it really allowed me to understand more of what I needed to work on. EAT Family Style gave me the opportunity to really reflect on some of my biases and how I interact with [teachers] and really just learn more about how to be an effective coach.

Administrator-level. ECE administrators valued that EAT Family Style intervention overlapped with other existing ECE programs, supported their beliefs and professional goals, and provided incentives that cover in-service hours and mini grants.

ECE administrators reported that they were primarily encouraged to participate in the intervention because of its resemblance to programs they were previously involved in such as Head Start and Go NAP SACC. In addition, they were also motivated to do responsive feeding EBPs of in their schools because it aligned with their beliefs and goals for their respective organization which include (but not limited to) children's healthy eating behaviors and positive mealtime context.

One reason why I wanted to do it was to make sure that we're teaching children that it is important to sit down eat like a family, that there are things you can talk about while you're sitting and eating and not just, you know, running around with food in your mouth and going from there.

ECE administrators valued incentives that support ongoing professional development among ECE educators and practitioners. Hence, they found it greatly important that their participation in EAT Family Style intervention covered the required hours for licensing and training. ECE administrators also shared that it was helpful they were provided with mini grants to buy the required materials and supplies for family style meal services in the classroom. For many ECE administrators, being able to purchase and use the recommended materials to do the program helped them commit in doing responsive feeding EBPs in their centers.

Teacher-level. Teachers perceived EAT Family Style intervention's relevance to children's healthful development, and valued the program incentives designed to address their needs.

EAT Family Style intervention's overarching goal of supporting children's healthful development was a strong influence on teachers' decision to participate. Specifically, teachers emphasized that they find it important that children gain information about health and nutrition early to guide future eating behaviors.

*I do feel like the healthy eating is a good choice for kids. I feel like they do need to learn it at a younger age so they can just grow up knowing what they should and shouldn't eat, what is healthy and what isn't.*

Like the administrators, the program incentives offered by EAT Family Style are crucial in teachers' involvement in the intervention. Specifically, teachers mentioned that the free one-on-one coaching, the coverage of the required in-service hours, and the free continuing professional development were highly motivating for many of them. In addition, teachers also identified the mini grants useful for obtaining the recommended equipment for doing family style meal services since many of the centers have limited capacity and resources to purchase the necessary materials. Aside from the mini grants, teachers also expressed their appreciation for the gift cards which they can use for their personal purchases.

**Implementation** describes coaches', ECE administrators', and teachers' use of key components of the programs, including adaptations and implementation strategies.

Coach-level. Coaches support ECE administrators and teachers' implementation of responsive feeding EBPs in schools through monitoring and feedback, and EAT Family Style program resources.

Coaches supported administrators and teachers through their regular coaching sessions where they encouraged participants to talk about their successes and challenges in using EAT Family Style. Coaches used this approach to better understand what the teachers/administrators needed, and then come up with strategies and support tailored to each participant's needs (e.g. those who had difficulty letting go non-responsive feeding practices that they consistently used in the past). They also used the coaching session to reinforce the use of EAT Family Style resources and materials in teachers' classroom practice. Consistent with this, teachers identified coaching as an important component of the program. Many of them shared that the coaching sessions provided them both practical and emotional support, and helped them become more mindful in meeting their lesson goals. These experiences were also shared by ECE

administrators and added the importance of coaching for clarifying aspects of the lessons and the weekly goals before using them in their classrooms.

Coaches used different program materials such as binders and individual online folders to track individual progress. They also referred to the teacher's goal sheets and mealtime recordings during their one-on-one coaching sessions to develop constructive feedback and coaching agenda.

I personally liked mealtime video recordings because then I had a lot more to talk to them and give like lots of positive feedback on. I think that really helped my relationship, especially with the one that was kind of, I could say, well, you know, I really saw that you were doing this and I saw that you even carried over you know, from the last lessons.

However, coaches reported that they were initially overwhelmed by the scope of the materials that they need to use for coaching. Coaches also mentioned their challenges in letting go coaching strategies they used in past programs that were not aligned with EAT Family Style strategies such as prescribing participants solutions to challenges, or simply giving out instructions.

Administrator-level. ECE administrators support teachers' implementation of responsive feeding EBPs in the classroom through administrative support.

To support their teachers, ECE administrators integrated school policies in their activities and events related to healthy celebrations and children's nutrition. In addition, they also developed scheduling arrangements and utilized "floating" staff to help teachers complete the EAT Family Style online lessons. They also mentioned that the parent handouts were useful not only in providing parents information about responsive feeding practices and family style meal services, but also as a visual tool for them to talk about simple tips that parents can use with their children at home. However, ECE administrators mentioned that finding the time to video record children's mealtime was sometimes difficult to do because of competing priorities in the classroom. ECE administrators also suggested that their teachers need additional time to familiarize themselves with the technology that they will be using for the program (e.g. video conferencing), and more flexible schedules to complete and practice the lessons before meeting with their coaches.

Give them enough time; time to get familiar with the technology with some practicing, practice Zooming. I would have my [teacher] do the lesson and then I would do my lesson and then we'd Zoom with the coach and then we'd record and then we'd start all over and I think I found myself a little stressed.

Teacher-level. Teachers implemented responsive feeding EBPs in the classrooms and used EAT Family Style program materials and resources.

Overall, teachers mentioned that they enjoyed using EAT Family Style responsive feeding with their students. For many of them, using different sensory activities for children to use and try were helpful in guiding students relate concepts learned in class with real objects (e.g. color of the food served). In addition, teachers also shared that they use EAT Family Style to help children explore different types of food, as well as encourage children to try the food served by watching their peers during mealtime.

Similarly, teachers perceived EAT Family Style responsive feeding practices helpful in managing the class. For instance, one teacher shared that she noticed her students became more engaged in class when she started using “star chart” and stickers as rewards. Aside from the use of non-food rewards, teachers also described how they became more involved in their students’ mealtime experiences. They shared that teaching children how to serve themselves helped them “bond” with their students.

I could do hand over hand, I could do, like, hold the glass. And I really liked that because I thought that particular thing got teachers involved instead of just having that for the kids. I think it was a bonding thing for the kids. And I liked the way that, you know, the materials encouraged the teachers to be a part of the dining experience with the kids because lot of times, somebody'll sit back with a Whopper in a bag, and not have much to do with the kids.

Teachers reported that EAT Family Style resources which include the online lessons, workbooks, handouts, and technology were informative and convenient to use. Specifically, they found examples of EAT Family Style strategies in the videos helpful for their classroom practice, while they use workbooks as supplementary materials to the online lessons. In addition, teachers also shared that having EAT Family Style Chromebooks allowed them to complete the online lessons during their most convenient time. However, they also talked about their challenges in using selected program materials and procedures initially (e.g. order of activities in the online lessons), and commented about how some of them can be time consuming, lengthy, and redundant (e.g. videos in the online lessons were too long and repetitive).

**Maintenance** identifies ECE centers’ motivations for using practices and strategies from EAT Family Style, and the changes they plan to continue in their schools. This section focuses on the extent to which EAT Family Style is intended to be integrated in the ECE centers’ practices and policies, as well as the professional routines of the coaches who served in the program.

Coach-level. Coaches intend to continue participating in EAT Family Style to build their professional skills and community partnerships.

Coaches plan to continue their involvement in EAT Family Style intervention because they feel that their efforts and skills as coaches were valued and appreciated. Similarly, coaches shared that they are motivated to continue partnering with EAT Family Style program because of the program incentives (e.g. classes, training hours) that cover their professional development activities free of charge.

Coaches also see the value of meeting other program coaches in expanding their professional network. They mentioned that simply knowing who to tap or contact for concerns could help them develop partnerships with fellow Extension practitioners.

*I enjoyed that initial training that we had out of the Extension Center solely for the fact of like, networking with other coaches out there because if you encounter somebody that you maybe haven't worked with previously or haven't come across the goals or maybe challenges that they're encountering. It was nice to know like, oh, you know, Linda would be somebody that I could contact and so that networking really*

*helped and just I'm somebody that I like to bounce ideas off other people so that in person training was really valuable."*

Administrator-level. ECE administrators intend to integrate healthy eating practices in the parent handbook and school policy.

ECE administrators emphasized that continuing the use of EAT Family Style strategies in their classrooms supports children's developing autonomy, growing vocabulary, and positive mealtime environment. To do this, they plan to integrate healthy celebrations and non-food rewards in their center policies. Specifically, ECE administrators mentioned that they plan to include non-food items in their parent handbook to substitute sweet foods typically offered to children during special celebrations.

But there are other ways to celebrate it, which I learned from that last lesson is there are [other] ways. So that is going into our policies and procedures and our handbook that instead of cake, bring bubbles or pencils or tattoos or stickers.

Teacher-level. Teachers intend to do more nutrition discussions with parents, and continue practicing different responsive feeding EBPs in the classrooms.

Teachers value the role of parents in shaping children's healthy eating behaviors. Thus, they plan to engage more in discussions with parents about children's nutrition and EAT Family Style dining to help parents understand mealtime practices that they use in their classrooms. Aside from engaging parents, teachers also intend to continue practicing responsive feeding EBPs by incorporating more sensory exploration activities in the classroom, and use of praise, peer and role modeling to encourage children to eat healthy foods at mealtimes. They also shared that they plan to continue mealtime discussion about the food served, include a sensory table for introducing different types of food, and keep encouraging children to try new foods especially those they do not like.

*"Having more food items, just in the classroom or like sensory stuff in a sensory table. I guess talking about food in ways, I mean, I always have kids that don't eat anything green. I don't know why, but if it's green, they won't touch it. And so, just encouraging them, not forcing them to eat it, but encouraging them and describing that food and learning more about that food. I would really like to do all that in the future as well."*

Table 4

provides descriptions of themes, subthemes, and representative quotes across all stakeholder levels, organized around the five RE-AIM dimensions.

	Coaches (n = 9) %	ECE Administrators (n = 8) %	ECE Teachers (n = 17) %
Age Mean	42	45	35
Racial Background			
American Indian or Alaskan Native	11	0	0
White or Caucasian	89	100	100
Educational Background			
High School Diploma / GED	0	0	11.8
Some College	0	12.5	47
Associates Degree	0	12.5	17.7
Bachelor's Degree	11	62.5	23.5
Graduate Degree	89	12.5	0
Years of Experience Working in Early Childhood			
Less than 1 year	22.2		5.9
1–2 years	22.22		35.3
3–5 years	0		17.6
6–10 years	0	12.5	17.6
11–15	22.22	25	11.8
More than 15 years	33.34	62.5	11.8
<i>Description of RE-AIM themes and subthemes across key stakeholders of Ecological Approach To (EAT) Family Style Multilevel Intervention including coaches, Early Care and Education (ECE) administrators and teachers.</i>			

## Discussion

This study used the five dimensions of the RE-AIM framework to evaluate the EAT Family Style multilevel intervention and its four implementation strategies designed to improve the implementation of responsive feeding EBPs, while detailing participants' reflections of their adoption of resource materials

and procedures during program delivery. Findings of this study demonstrate arrays of potentials in using a multilevel approach by targeting different levels of influences that affect children's nutritional health and behaviors in ECE through individual-level (e.g. attitudes and beliefs), intrapersonal level, (e.g. administrator, teachers) and organizational level (e.g. ECE policies and mealtime practices).

For the effectiveness dimension of RE-AIM, coaches, ECE administrators, and teachers reported that implementing the responsive feeding EBPs improved child dietary outcomes. Our results specifically draw attention to how ECE administrators and teachers relate responsive feeding EBPs with observable positive dietary changes in children. Consistent with previous quantitative research demonstrating evidence of responsive feeding practices on children's dietary behavior (14, 61, 62), and quantitative findings from the EAT Family Style intervention (63) findings of this study reveal that teachers' use of responsive feeding EBPs such as role modeling, peer modeling, using rewards and praise, and sensory exploration at mealtimes promoted the following positive dietary outcomes in children: increased consumption of healthier foods, greater willingness to try fruits and vegetables, increased food intake of picky eaters, and improved self-regulation through internal cues of fullness. These results are also supported by quantitative results from a sub-set of ECEs who participated in EAT Family Style showed children's consumption of fruits and vegetables (63). Overall, these findings are encouraging as they suggest that evidence-based child outcomes of using responsive feeding practices resonated well among the teachers in the study.

Quantitative research on children's nutrition has consistently shown that a supportive feeding environment fosters children's positive relationship association with the foods served, which subsequently promotes healthy eating habits (64, 65). In line with this, findings of this qualitative study offer new insights regarding teachers' perception of responsive feeding EBPs. Contrary to frequently reported challenges by teachers to practicing responsive feeding EBPs (37), none were reported by the study participants. Rather than reporting family style meal service as being messy and unhygienic or their mistrust of children's ability to self-regulate intake, teachers reported more instances of pleasant mealtimes with children, reduced stress, children being more engaged, and reduced food wastage in the classroom.

Depicting teachers' perceptions of pleasant mealtime environment, Mita et. al (66) has developed a conceptual framework which consists of five components: 1) people, 2) positive emotional tone, 3) rules, expectations, and routines, 4) operations (i.e., eating, socialization, and learning), and 5) short-and long-term outcomes. Consistent with this conceptualization, findings of this study demonstrate both teachers and children contribute in creating calmer mealtimes through the interrelated processes of eating (e.g., eating healthy foods, role modeling, willingness to try new foods), socialization (e.g., asking questions, sharing what they learned in the day), and learning (e.g., motor skills, self-help skills). In addition, the notable shift from stressful to more pleasant and calmer mealtime context reported by teachers can be attributed to the underlying characteristics of responsive feeding. For example, our findings have indicated increase in teachers' engagement in the mealtime experiences of children through conversations that teach children about food and nutrition helped create a more pleasant mealtime

classroom environment. Similarly, Gable & Lutz (67) found that teachers who practiced positive mealtime behaviors of socialization and engagement contributed to positive mealtimes.

Taken together, this qualitative study presents teachers' perceptions about fostering pleasant mealtime environment with implementation of responsive feeding EBPs. However, experimental studies are needed to determine whether responsive feeding EBPs predict PME and if this correlates to improved dietary intake of children. Given that PME is related to improving children's dietary intake in the home setting (68), understanding the factors that contribute to a PME could be a promising but untapped avenue for improving children's dietary adequacy within ECE settings.

EAT Family Style multilevel intervention used evidence-based implementation strategies to facilitate delivery and address challenges across different phases in the program. Firstly, at the organizational level, findings show that the intervention's pedagogical approach of using a hybrid online model was crucial for program delivery and support. Stakeholders' positive experiences in using the blended features of online training and learning via one-on-one coaching is noteworthy. This finding not only demonstrates potential for supporting practitioners' delivery of EBPs in ECEs, but also the strength in using flexible platforms to pursue ongoing professional development. As previous work frequently mentioned the limited or lack of nutrition education training among ECE practitioners as one of the primary reasons for slow uptake of responsive feeding EBPs in ECEs (64, 69) along with challenges related to access and availability to nutrition trainings (especially for rural ECEs) (70), our findings illustrate advantages in using the hybrid approach. Many of the Cooperative Extension coaches and ECEs that participated in this study were located in distant and rural communities, thus the blended features of the intervention allowed for consistent delivery of training and ongoing support across the multiple stakeholder level. This finding is especially important given the high prevalence of childhood obesity in rural areas (71).

A central component of the current intervention was dependent on program coaches' monitoring and feedback of both teachers' individual classroom mealtime and the ECE administrators' organizational support. Given this promising result, more studies are therefore needed to determine the role of coaching in the ECE setting as an implementation strategy for improving uptake of EBPs. In addition, research suggests the need for professional development that highlights collaborative approaches in which practitioners can "try new ideas, reflect on outcomes, and co-construct knowledge about teaching and learning within the context of authentic activity" (72). Hence, future interventions can also explore ECE professional learning communities where peers meet and collectively share their motivations, challenges, or strategies with a skilled facilitator guiding the group's discussion and reflections (73).

This study has several strengths. Our findings contribute to existing evidence of responsive feeding EBP's efficacy in promoting children's ability to self-regulate food intake, and improved acceptance of novel/healthy food choices. This study included participants across eight ECEs with varying characteristics and capacity (e.g., center/classroom size, center resources). This inclusion demonstrates that findings of this study can be used to inform capacity of similar ECEs to deliver quality nutrition

related programs such as EAT Family Style. This qualitative study also highlights the importance of using perspectives across different levels of stakeholders in informing program effectiveness.

Findings must be interpreted within the study's methodological limitations. First, the study participants may not represent the larger population of ECE settings. Further, study ECEs were participating in CACFP, so results may not be generalizable to all ECE settings despite the purposive sampling enhance in geographical representation. Additionally, this study mainly focused on the insights of center-based ECE administrators' and teachers' implementation and did not include other staff involved in food preparation (kitchen assistants, cooks). Thus, future studies should include a broader perspective of viewpoints from racially diverse backgrounds, multiple levels of staff within ECE setting, and different ECE settings (e.g. non-CACFP sites). Another limitation lies in the semi-structured interview processes. While all participants were informed that their responses would remain confidential to improve the EAT Family Style program, there is a risk of social desirability bias and researchers assume that all responses were honest and grounded in reality. The results of this study should be interpreted in light of this assumption.

## Conclusion

Findings of this qualitative study underline the importance of responsive feeding EBPs in improving children's nutritional health and behaviors, and the overall mealtime environment in ECE settings. We anticipate that further studies will provide novel and valuable information on the relations between responsive feeding EBPs and pleasant mealtime environment, and their impact on children's nutritional outcomes. In addition, the program's use of a multilevel implementation model has the potential for building capacity and improving uptake of responsive feeding EBPs in ECE.

## List Of Abbreviations

**CACFP:** Child and Adult Care Food Program

**EAT Family Style:** Ecological Approach to Family Style

**EBP:** Evidence-based practice

**ECE:** Early care and education

**RE-AIM:** Reach, Effectiveness, Adoption, Implementation, Maintenance

**SDT:** Self-Determination Theory

## Declarations

**Ethics approval and consent to participate**

The University of Nebraska – Lincoln Institutional Review Board approved all procedures in this study. All participants provided written informed consent before participating in this research study.

### **Consent for publication**

All participants provided written informed consent for data to be published as aggregate data with their identity remaining confidential.

### **Availability of data and materials**

The datasets generated and/or analyzed during the current study are not publicly available, but are available from the corresponding author on reasonable request.

### **Competing interests**

The authors declare that they have no competing interests.

### **Funding**

This work was supported by the US Department of Agriculture National Institute of Food and Agriculture, Hatch Project NO. 1011204 and the Nebraska Agricultural Experiment Station awarded to Dr. Dipti Dev.

### **Author's Contributions**

DAD designed this study and intervention, conducted participant interviews, analyzed and interpreted data and was a major contributor in writing the manuscript. IP and CH analyzed and interpreted data and were major contributors in writing the manuscript. DD extensively reviewed and revised the manuscript. VCS contributed to data analysis and interpretation. All authors read and approved the final manuscript.

### **Acknowledgements**

The authors would like to acknowledge Madeleine Sigman-Grant for her contributions regarding scientific and technical writing.

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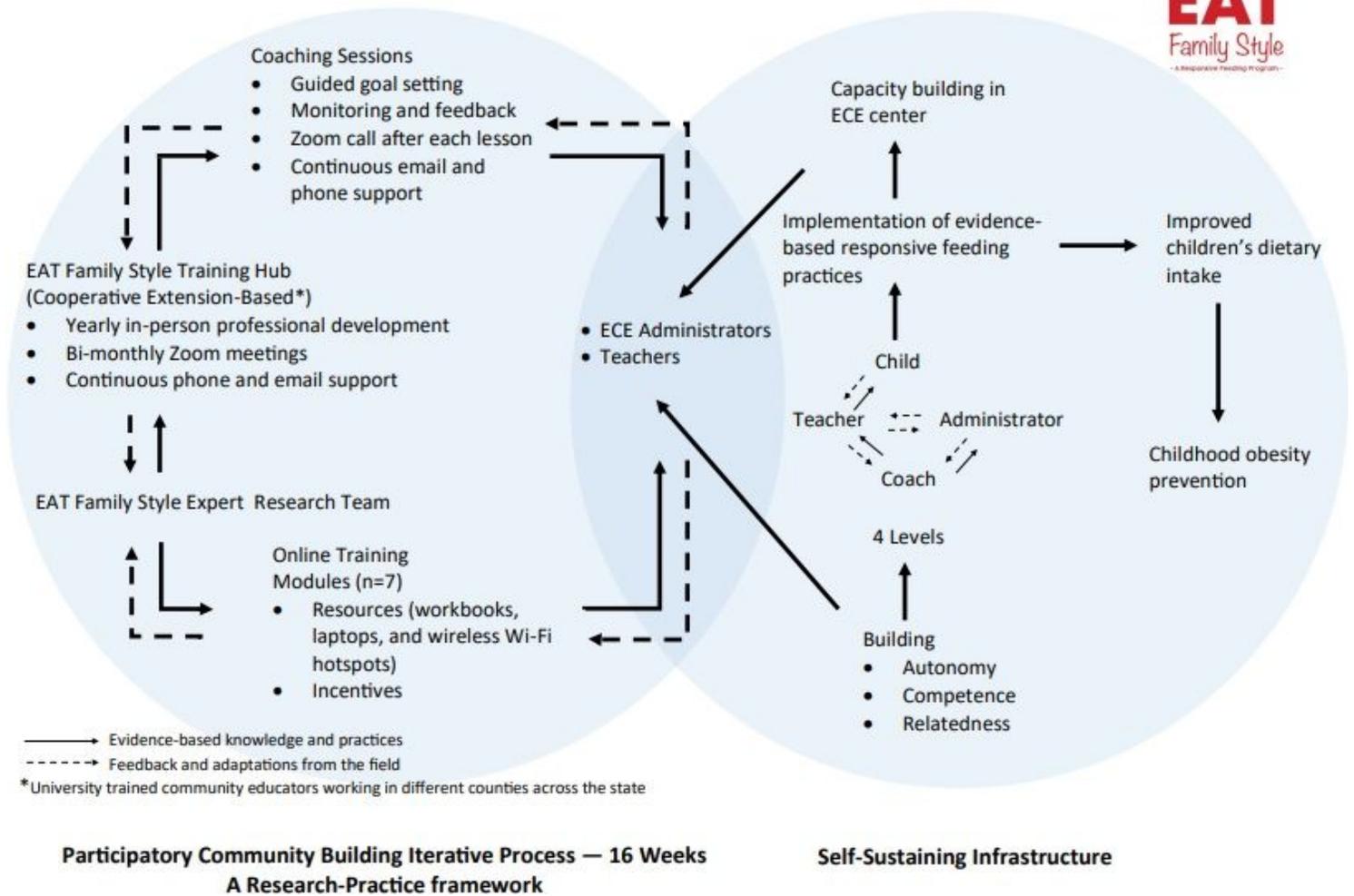
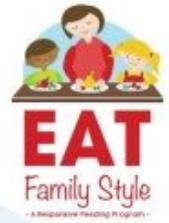
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## Figures



**Figure 1**

The Ecological Approach To (EAT) Family Style Multilevel Implementation Model