Caring for Our Children Health and Safety Standards into Child Care Practice: Child Care Health Consultation Improves Infant and Toddler Care

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ABSTRACT

Introduction: Many families enroll their infants and toddlers in early education and child care programs. The Pennsylvania Chapter of the American Academy of Pediatrics (PA AAP) recruited 32 child care centers that care for infants and toddlers (I/T) to be linked with a child care health consultant (CCHC).
Method: Project staff assigned the centers alternately to an Immediate Intervention or a one-year Delayed Intervention (Contrast) group. At entry into the project, and then one and two years later, an evaluator assessed center compliance with 13 standards for infants and toddler care selected from *Caring for Our Children: National Health and Safety Performance Standards, 3rd ed.* [*CFOC3*]. Project staff linked the Immediate Intervention centers with a CCHC in year one. In year two, in a cross-over comparison, project staff linked Contrast centers with a CCHC.
Results: Working with a CCHC effectively improved compliance with some selected health and safety standards.

MANUSCRIPT

INTRODUCTION

Nationally, about 48% of children less than 3 years of age are enrolled in organized child care facilities. (Laughlin, 2013). Early educators (child care staff) care for these children for many hours and many days. The quality of their care has life-long impact on their physical, developmental and social-emotional well-being (Garcia, Heckman, Leaf, & Padros, 2016).

In 2013, the Early Childhood Education Linkage System [ECELS], a program of the Pennsylvania Chapter of the American Academy of Pediatrics [PA AAP] received a 3-year grant from the Maternal and Child Health Bureau [MCHB]. The purpose of the grant was to "improve state infant/toddler [I/T] child care quality initiatives (Quality Rating and Improvement Systems [QRIS] and professional development) …" MCHB's grant required selection and promotion of 10 or more standards from a list provided by MCHB from *Caring for Our Children: National Health and Safety Performance Standards; Guidelines for Early Care and Education Programs, 3rd ed*. [*CFOC3*] *(American Academy of Pediatrics et al. [AAP], 2011).*

Child care programs in Pennsylvania's [PA] QRIS, called Keystone STARS, are ranked from the entry level at STAR 1 to STAR 4. To earn a rating, programs must comply with state regulations and meet the requirements listed for the designated STAR level on the PA Key website at www.pakeys.org. For a STAR 4 rating, a center that serves infants and toddlers must have scores at or above "5 = good" on the 7 subscales of the *Infant and Toddler Environment Rating Scale-Revised Edition* [ITERS –R] (Harms, Cryer, & Clifford, 2006). The Personal Care Routines sub-scale of ITERS-R has some health and safety items. Scores in this subscale and on health and safety items in some of the other subscales are among the lowest scoring ITERS-R items in Pennsylvania and elsewhere. This finding is reported by the *Pennsylvania Key–Program Quality Assessment Team* (Pennsylvania Key, 2016) and by the authors of ITERS-R (Personal communication by Harms and Cryer to S. Aronson).

Child care health consultants [CCHCs] use observation, education, collaborative decision-making, coaching and mentoring to achieve quality improvement in the QRIS (Zaslow, Tout & Halle, 2012). CCHCs base their work on needs and feasible implementation. For more than a decade, published research has confirmed child care health consultation is an effective approach to improve health and safety compliance with national child care standards. (Alkon & Bernzweig, 2008; Alkon et al. 2008; Alkon, Bernzweig, Kim, Wolff, & Mackie, 2009; Alkon et al, 2014, Alkon et al. 2016; Alkon, Sokal-Gutierrez & Wolf, 2002; Banghart & Kraeder, 2012; Carabin et al, 1999; Cole, 2008; Crowley, 2006; Isabell et al 2013; Moon & Oden, 2005; Organizational Research Services & Geo Education& Research, 2007; Pacific Research & Evaluation, 2007; Ramler, Nakatsukasa-Ono, Loe & Harris, 2006; Roberts et al, 2000a; Roberts et al, 2000b) Most of these studies involved did not specifically target care for infants and toddlers.

Published studies document the following specific improvements associated with involvement of a CCHC. Sanitation and hygiene reduced respiratory and gastrointestinal illness and days absent for illness among young children in group care (Carabin et al, 1999; Kotch et al, 2007; Roberts et al, 2000a; Roberts et al, 2000b). Nationally recommended practices related to active play, nutrition and food handling were adopted (Alkon et al, 2014). Policies and procedures accompanied by staff training reduced hazards and injuries (Kotch, 2002; Organizational Research Services and Geo Education & Research, 2007). Training about safe infant sleep positioning and the infant sleep environment reduced risk of Sudden Infant Death Syndrome (Moon & Oden, 2005; Cole, 2008). Better monitoring and tracking of immunization data in child care programs was associated with more children having up-to-date vaccine documentation (Alkon & Bernzweig, 2008).

The PA AAP established ECELS in 1989. ECELS maintains a Child Care Health Consultant Registry and regularly communicates with registered CCHCs to provide professional development, technical assistance and tools to enable their implementation of the CCHC role. Pennsylvania's CCHCs include private and public health service providers as well as health professionals who teach in academic settings. Funding for CCHC work is unpredictable, making recruitment, education and retention of CCHCs challenging.

Pennsylvania's child care regulations require that child care providers have documents that show enrolled children are up-to-date with preventive health services recommended by the American Academy of Pediatrics [AAP], including "A review of the child's immunized status according to recommendations of the ACIP." (Pa Department of Human Services[PaDHS], 2008) This regulation is not enforced. Few providers use any reliable way to ensure enrolled children are up-to-date. ECELS encourages child care centers to use a well-tested and routinely updated online software application called WellCareTracker™ to check child health records for up-to-date routine preventive health services. It is described, demonstrated and offered for subscription at www.wellcaretracker.org. Using WellCareTracker™ eases the burden for child care providers to comply with the regulation and remind families to obtain these services in a timely manner.

METHODS

Design

The PA AAP's MCHB-funded Infant-Toddler Quality Improvement Project [ITQIP] was conducted by ECELS using a randomly assigned clinical trial with a cross-over comparison of centers assigned to an Immediate Intervention or Delayed Intervention (Comparison) Group. ECELS 1) assessed child care center practices related to I/T care for 13 selected *CFOC3* standards (AAP et al, 2011), and 2) assessed whether compliance with these practices improved when centers were linked with a CCHC.

Selection of the *CFOC3* standards addressed in ITQIP

With input from early care and education stakeholders, ECELS chose 13 *CFOC3* standards (AAP et.al, 2011) from a list provided by MCHB (Table 1). The selection criteria were that the standard is: a) associated with the highest and most common risks of harm to I/T, (American Academy of Pediatrics et al, 2013), b) measurable and amenable to improvement with technical assistance and professional development provided by a CCHC over a 12-month period, and c) found by state inspectors to have a high level of non-compliance according to state data (PA Office of Child Development and Early Learning, 2010).

Table 1: *CFOC3* Standards Chosen for ITQIP

Evaluation Plan,

The evaluation plan is a classic randomly assigned cross-over clinical trial. See Figure 1 for the Evaluation Plan Logic Model.

Figure 1: Evaluation Plan Logic Model

The ITQIP staff and consultants developed the evaluation tool described below. The ITQIP Project Coordinator (first author) and the evaluators collected data from participating centers at three points: when centers enrolled in the study (Pre-Test) and then a year and two years later, (Post-Test1 and Post-Test2). One of the consultants (fourth author) compared the two groups on the Pre-Test for equivalency and then on each of the two Post-Tests. These data are discussed in Results: Immediate Intervention vs Delayed Intervention (Contrast) Group. One year after the Pre-Test data were collected, the participating centers were switched to a cross-over comparison format. At this point, ITQIP ended the subsidy for the CCHCs who were working with the centers in the Immediate Intervention group and provided the subsidized CCHC linkage to the centers in the Delayed Intervention (Contrast) group.

When a center enrolled in ITQIP, the ITQIP Coordinator interviewed the center director by phone. She gathered demographic data, including the number of enrolled I/T, where and when I/T activities occurred in the center, and the number of children who met the MCHB definition of special health needs. She asked the director to submit up to five of any care plans the center had for these children, redacted for confidentiality. The MCHB definition of a child with special health care needs is noted in *CFOC3* standard 3.5.0.1 as: "A child who has or is at increased risk for chronic physical, developmental, behavioral or emotional conditions and who requires health and related services of a type or amount beyond that required by children generally." (AAP et al., 2011).

The ITQIP Coordinator selected the rooms for the evaluator to observe as those with the largest number of children in the age group. The evaluators recorded observations in one infant and one toddler room in each center.

The evaluator collected a random sample of immunization records for up to 10 infants and 10 toddlers with the names redacted for confidentiality. The ITQIP Coordinator used WellCareTracker™ software to check these immunization records. The ITQIP Coordinator evaluated the care plans that the director submitted for the presence of the appropriate components from the list of the 14 components specified in *CFOC3* standard 3.5.0.1. (AAP et al, 2011) and a 15th component, the presence of the health care provider's signature that is required by Pennsylvania regulations. See Table 2.

Table 2: Care Plan Components Evaluated for Children with Special Needs

The ITQIP Coordinator scored the evaluator's observations of diapering, hand hygiene, and medication administration. She promptly prepared a summary of all the findings for the center and sent the summary to the center director and the linked CCHC before the first CCHC site visit. The summary delineated areas of strengths and areas to improve based upon the evaluation tool results. To facilitate use of the data by the center staff and CCHC, the summary included the text of the evaluation tool item, the center's score on the item and the reason why the center met or did not meet the standard. The CCHC contacted the center within 2 weeks after receiving the summary to set up the initial site visit.

Evaluation Tool:

The ITQIP staff prepared the items on the evaluation tool from performance guidelines specified in the 13 selected *CFOC3 standards* (AAP et al, 2011). ITQIP consultants (fourth and fifth authors) and the ECELS staff reviewed the tool for clarity and validity of content. After several rounds of revisions, the ITQIP Coordinator and a prospective ITQIP evaluator field-tested the tool, further revised and then field-tested it again, this time testing for inter-rater reliability with 2 evaluators independently and simultaneously using the tool.

The ITQIP evaluation tool has 4 sections: 1) Demographic Information collected in the phone interview- 35 items, 2) Observations - 64 items, 3) Interview Questions - 28 items and 4) Documents- 14 items. The score awarded to items on the evaluation tool was based on the criteria listed in Table 3. A score of two or three for an item was considered a strength and a score of zero or one for an item was considered an area to improve. This total score was the sum of the scores for each item. The total number of scorable items on the evaluation tool is 106 with a maximum score of 318. The documents assessed include training records, written policies, care plans for children with special needs, immunization data and PA child abuse clearances.

Table 3: Criteria for Scores Assigned to Items on the Evaluation Tool

ITQIP assigned each scorable item to one of the 10 topic areas addressed by the 13 *CFOC3* standards selected for the project (AAP et al, 2011). (Table 4)

Table 4: Topic Areas and Number of Items to Score per Topic

Sampling Design: Recruitment, random assignment and retention of centers

ECELS recruited Keystone STAR 2 and STAR 3 centers by distributing a flyer about the project. Programs with higher STARS ratings qualify for higher payments for children whose care is state-subsidized. The highest payments are for children enrolled in STAR 4 centers. The increased payment for a higher rating is a quality improvement incentive. Also, ECELS offered participating centers 3 free $10 credit-awarding reviews for ECELS self-learning modules. The flyer was included in the newsletters of a variety of organizations: four of the five regional state-supported sources of professional development (Regional Keys,) the PA Child Care Association, the Pittsburgh Association for the Education of Young Children and United Way. Since the Northwest region of the state has the fewest centers, recruitment from that region was not attempted.

As the centers joined ITQIP, the project Coordinator assigned them alternately to one of two groups, either the Immediate Intervention Group or the Delayed Intervention (Contrast) group. ITQIP enrolled centers from all four targeted regions of the state.
Centers enrolled in ITQIP agreed to:

- allow a four to five hour site evaluation once a year for three years
- work with a CCHC for a period of one year to improve I/T health and safety
- accept random assignment to the one of the two project groups
- provide access to redacted immunization records and care plans for evaluation
- pay $240.00 of the $500 honorarium ITQIP paid to their CCHC
- remain in ITQIP for three years.

Recruitment and Roles of Evaluators and CCHCs

Evaluators: ITQIP recruited 17 evaluators from the list of CCHCs who had previously received CCHC training from ECELS, and from the nurses in the Maternal Infant and Early Childhood Home Visiting Program (MIECHV). All evaluators were health professionals with pediatric experience related to observed items. Most had experience working with *CFOC3* standards (AAP et al, 2011). The evaluators learned how to use the evaluation tool by participating in a live webinar or by using the recording of the webinar. All evaluators received a copy of the evaluation tool and a training manual with instructions for completing the evaluation. Seven evaluators were also CCHCs in this project. None of the evaluators who were CCHCs in ITQIP were linked with centers they evaluated.

The evaluators gave their completed evaluation tools to the ITQIP Coordinator to score and summarize. The Coordinator reviewed each submitted evaluation tool, and then discussed the documentation with the evaluator by phone to make sure the scoring was as intended.

CCHCs: ECELS recruited 14 RN's and 1 MD as CCHCs. The ITQIP Coordinator (first author) has worked as a CCHC for more than 15 years. She and the project's Director and Primary Investigator, a pediatrician (second author) educated, coached, mentored and supported the work of the CCHCs. The CCHCs participated in a webinar about the project scope, and the use of the selected *CFOC3* standards(AAP et al, 2011). They received a

training manual that included the 13 selected *CFOC3* standards (AAP et al, 2011) and resources to support best practice in each of the 10 topic areas. ITQIP provided additional resources and periodic *CFOC3* updates (APP et al, 2011).

During the site visit, the CCHC compared her observations with those in the summary and solicited concerns about health and safety practices from the center's staff. Then the director, program staff and CCHC chose three of the 10 topics as the primary focus of the center's improvement. The CCHC helped the center staff prepare an Action Plan to work on the three topic areas they chose. Action Plans included filling gaps in knowledge, developing policies for staff and family handbooks, and improving staff practices. The CCHCs and center directors arranged all subsequent contacts and visits over the next 12-months.

Quarterly, the CCHCs sent the ITQIP Coordinator documentation of their work and progress toward goals. The CCHCs submitted the center's initial Action Plan and a final Action Plan at the end of the year that showed what the center accomplished. ITQIP paid $250 to the CCHCs upon receipt of the center's initial Action Plan and date of the first CCHC visit. ITQIP paid the CCHCs an additional $250 after they submitted the final Action Plan from their 12-month linkage. Throughout the project, the ITQIP Coordinator reviewed quarterly encounter forms that the CCHCs submitted to describe their work with the centers. This enabled the ITQIP Coordinator to suggest ways to promote progress on Action Plans, including use of relevant health and safety resources.

RESULTS

Descriptive Report

ITQIP linked CCHCs with 32 centers. Of these, 16 centers were in the immediate CCHC linked group and 16 in the CCHC delayed-linked group. In all, 59 directors, 348 I/T teachers and 1490 infants and toddlers were directly involved in ITQIP. Three centers from each group dropped out, leaving 13 centers in each group at the completion of the project. See Table 5.

Table 5: Location and Retention of Recruited Centers

Over the one-year period of CCHC linkage, twelve of the 32 programs had turnovers of two to four directors. This change in center leadership made the CCHC's work to improve I/T care very difficult. For the Immediate Intervention group, three of the original 16 centers withdrew from the project. One center in the Delayed Intervention (Contrast) group closed during the project period; two others withdrew from ITQIP. Some centers dropped out because they were so overwhelmed with maintaining ratios in classrooms and staffing issues that they felt they couldn't focus on their Action Plans.

This report compares Pre-Test, Post-Test1 and Post-Test2 scores for the 13 Immediate Intervention sites and 13 Delayed Intervention (Contrast) sites that remained enrolled in ITQIP for the full three years.

ITQIP did not require a specific time spent in the CCHC role for each linkage. The CCHCs in the Immediate Intervention group provided an average of 14 hours of consultation per site (range 2.25 hours to 28.75 hours). The CCHCs in the Delayed Intervention (Contrast) group provided an average of 12.5 hours of consultation per site (range 2 hours to 32 hours). The CCHCs completed quarterly encounter forms to report the total hours of services to their linked center, including a checklist of onsite, phone and e-mail services. The most common CCHC interactions with centers included providing health education for the director and staff, on site consultation at the facility, technical assistance by phone or e-mail, providing print or audio-visual materials, helping the facility to comply with state regulations, and developing health policies and procedures.

Topics chosen by the centers in the Immediate Intervention group and the Delayed Intervention (Contrast) Group and the number of centers that chose each topic are shown in Table 6.

Table 6: Topics Chosen by Centers by Intervention Group

Quantitative Comparison of Evaluation Tool Scores on the Pre-Test to the Two Post-Tests

The scores used in the quantitative comparisons are the sum of all scores on the Evaluation Tool, not only those for the topics that the center chose for special focus. (See Table 7).

Table 7: Quantitative Comparison of Evaluation Tool Scores on the Pre-Test to the Two Post-Tests

Immediate Intervention Group

On the Pre-Test, the range in scores was 175 to 267 with an average score of 212 out of a possible 318 points (66%). On Post-Test1, the range in scores was 213 to 297 with an average score of 254 out of a possible 318 points (79%). This change from Pre-Test to Post-Test1 was statistically significant ($t = -4.62$; $p < .0001$). Post-Test2 did not show any significant change from the average score on the Post-Test1, demonstrating that the initial results from the intervention were sustained in the next year (254 to 254).

Delayed Intervention (Contrast) Group

On the Pre-Test, the range in scores was 164 to 271 with an average score of 218 out of a possible 318 points (68%). On Post-Test1, the range in scores was 149 to 257 with an average score of 221 out of a possible 318 points (69%). These changes from Pre-Test to Post-Test1 were not significant. Post-Test2 showed significant change in the average score from Post-Test1 (221 points) to Post-Test2 (243 points) ($t = -1.80$; $p < .08$) a year after this Delayed Intervention (Contrast) group had received their CCHC linkage.

Immediate Intervention versus Delayed Intervention (Contrast) Groups

The comparison of the average scores between the Immediate Intervention (212) and Delayed Intervention (Contrast) (218) groups on the Pre-Test was not significant, demonstrating that the groups were equivalent. The difference between the average scores of the Immediate Intervention (254) and Delayed Intervention (Contrast) (221) groups on Post-Test1 was statistically significant ($t = -3.46$; $p < .002$), demonstrating the effectiveness of the CCHC intervention for the Immediate Intervention group. Post-Test2 showed no significant difference

between the change in the average post-intervention scores for the Immediate Intervention group 12 months after their CCHC-subsidized linkage and the Delayed Intervention (Contrast) group (254 vs 243) at the end of their 12 months of CCHC-subsidized linkage. See Figure 2 for the Crossover Comparison Results.

Figure 2: Crossover Comparison Results

The Crossover Comparison Results (Figure 2) shows the relationship between the Immediate Intervention and the Delayed Intervention (Contrast) groups in a Crossover design. It clearly demonstrates how effective the intervention (Pre-Test to Post-Test1) was for the Immediate Intervention group and that the effects persisted after one year without a subsidized CCHC linkage (Post-Test1 to Post-Test2). It also shows that the intervention was effective when the Delayed Intervention (Contrast) group was switched to receive the CCHC intervention with targeted training, technical assistance and collaborative consultation a year after their Pre-Test assessment. (Post-Test1 to Post-Test2).

For the Immediate Intervention Group, after one year of linkage with a CCHC

Among the items in each topic area (See Table 4), the following items showed statistically significant improvement (Pre-Test to Post-Test 1):

Medication Administration: The director has documentation that the staff who are authorized to give medications have received medication administration training within the year from a health professional ($p < .001$).

Safe Sleep: The number of written safe sleep policies containing the required elements ($p < .05$). Teachers ($p < .01$) and parents ($p < .05$) reviewed the safe sleep policies and who were educated about safe sleep practices ($p < .05$).

Child Abuse: Child abuse policies contain the required elements ($p < .05$). Both infant and toddler teachers are educated about child abuse and how, as mandated reporters, they are required to personally report incidents they suspect might involve child maltreatment ($p < .001$). The number of centers having required clearance documents on file for teachers ($p < .05$).

Active Opportunities for Physical Activity: Infants (birth to twelve months of age) are taken outside two to three times per day, as tolerated ($p < .05$). Toddlers (twelve months to three years) go outside except in weather that poses a significant health risk ($p < .05$).

Diaper Changing: Prior to the beginning of the diaper change, changing table paper was placed over the diapering surface, followed by the gathering of supplies needed for the diaper change from the containers in which they are stored, and use of gloves ($p < .05$).

Hand Hygiene: Observed times that toddlers ($p < .01$) and the toddler teachers/caregivers ($p < .05$) should have washed their hands showed statistically significant improvement after CCHC linkage.

For the Delayed Intervention (Contrast) Group, after one year of linkage with a CCHC

Among the items in each topic area (See Table 4), the following items showed statistically significant improvement (Post-Test 1 to Post-Test 2):

Safe Sleep: Safe sleep policies that contained all the elements that should be in a safe sleep policy per *CFOC3* standard 3.1.4.1. ($p < .05$) (AAP et al, 2011). The facility had documentation that parents reviewed the center's safe sleep policy and were educated about safe sleep practices ($p < .05$). There was no soft or loose bedding or other objects in a crib when an infant was in the crib ($p < .05$). Caregivers and teachers checked on sleeping infants often enough (about every 5 minutes) to be sure that the infant was still breathing ($p < .05$).

Medication Administration: The name of a child to receive medication was verified before the medication is administered to that child ($p < .05$).

Diaper Changing: Bottom clothing was removed, including shoes and socks, if feet are unlikely to kept from contacting soiled skin or surfaces. If clothing is soiled, it is removed and placed in a plastic bag ($p < .05$).

Special Needs: The number of care plans submitted that included the required elements in a care plan for children with special needs per the *CFOC3* standard 3.5.0.1($p < .05$). (AAP et al, 2011).

Additional Findings of Interest

Immunization Documentation: Only one center chose to work on documentation of up-to-date immunization status as an Action Plan focus. Overall, the immunization data for the two groups revealed low compliance with *CFOC3* standard 7.2.0.1(AAP et al, 2011) and Pennsylvania's immunization regulations (PaDHS,2008). On the Pre-Test, in the Immediate Intervention centers, 22% of the immunization records for infants and 43% of the immunization records for toddlers were up to date. Little change occurred for this group on Post-Test1 (36% for infants, 43% for toddlers.) On the Pre-Test for the Delayed Intervention (Contrast) centers 25% of the immunization records for infants and 40% of the immunizations records for toddlers were up to date. On Post-Test1 the Delayed Intervention (Contrast) centers improved from 25% to 38% for infants, but dropped from 40% to 27% of the records for toddlers showing up-to-date vaccines.

Care Plans for Children with Special Needs: The data for the two groups revealed low compliance with *CFOC3* standard 3.5.0.1 (AAP et al, 2011) that lists the components for care plans. Combining the Immediate Intervention and Delayed Intervention (Contrast) centers findings for this topic, the Pre-Test revealed 66 I/T identified with special health care needs in the 32 centers initially enrolled in ITQIP. Only 15 (23%) of I/T with identified special health care needs had any care plan signed by a health care professional. Only 1 of 66 I/T with special health care needs had a care plan signed by a health care professional that had all necessary components for optimal daily and/or emergency care. Post-Test2 revealed 39 I/T identified with a special health care need in the remaining 26 centers. For children identified by the centers as having a special health care need, 62% did not have a Care Plan. Fifteen (38%) of those with identified special health care needs had a care plan signed by a health professional. Four of the 15 care plans had all the required elements. Examples of children who had special needs and had no care plan signed by a health care provider included children with: gastro-esophageal reflux

taking Zantac, febrile seizures, asthma, multiple epi-pens on site, autism, non-febrile seizures, torticollis and plagiocephaly, requiring a helmet be worn each day.

DISCUSSION AND CONCLUSIONS

Quality early education and child care has been shown to be associated with life-long benefits. (Garcia, Heckman, Leaf, & Padros, 2016). Young children are especially vulnerable to infectious diseases and injuries because of their age-appropriate behavior and abilities, their immature immune systems and lack of understanding of risk. Maintaining safe and healthful environments and practices involves removal of hazards and provision of policies and procedures as well as compliance with quality standards by everyone in the group.

Numerous studies have demonstrated the effectiveness of child care health consultation. This study focused on infant-toddler care. The Immediate Intervention group showed significant improvement in policy development for safe sleep and child abuse, and in education about safe sleep practices, preventing child abuse and medication administration training. Some improvement in diaper changing and hand hygiene procedures occurred. The delayed intervention(contract) group showed significant improvement in safe sleep procedures, policies and education, medication administration procedure, diaper changing procedures and care plans for children with special needs with appropriate information and signed by a health care provider.

The data collected by ITQIP show that many children with special needs lacked appropriate care plans. After finding little improvement in the Immediate Intervention Group for centers having care plans with needed elements, ITQIP chose this topic as the focus of a MCHB-required continuous quality improvement initiative. ITQIP provided an audioconference for the CCHCs and gave them resources for teaching what should be in a care plan. CCHCs reported that they were most successful at helping the centers have complete, useful care plans for children with disease-specific conditions.

The areas chosen to target varied from center to center. Immunization was only chosen by one center. At the time of the study, neither regulation inspectors nor quality rating assessors were checking whether the center had documentation that the enrolled children were up to date with their vaccines. With little incentive or sanctions, documentation of up-to-date immunization status was poor.

Improvements occurred in some practices specified in selected *CFOC3* standards. Many of the directors said they appreciated the help they received from the CCHCs that ITQIP linked with their centers. The director of one center, part of a corporation with centers in 12 states, advocated for improving sleep policies for all the centers in her company. This advocacy could lead to widespread improvement.

The centers that participated in this project were STAR 2 and STAR 3 programs that responded to an invitation participate in ITQIP to improve. They were willing to contribute a modest co-payment to work with a CCHC and wanted to raise their STAR rating and consequent higher

payments for subsidized enrollees. This selection bias is likely to have influenced the observed improvements.

A limitation of the study is the small sample size due to limited funding for the project. Also, while the study assessed practices for 13 *CFOC3* standards (AAP, 2011), the centers addressed only three topic areas. Little improvement was seen in topics that were not chosen or chosen less frequently. Change in leadership at the centers with varying levels of interest in working on the Action Plans made improvement difficult.

Another limitation of the study is the variability in child care operation from one facility to another and from year to year. Evaluators were unlikely to have been evaluating the same children from Pre-Test through Post-Test 2. Different teachers/caregivers and children may occupy designated rooms in a facility. ITQIP did not require that the CCHCs spend a specific amount of time with their centers. The time and type of service provided by CCHCs varied widely. While CCHCs reported the total time and types of services they provided, they were not asked to report the time spent in each type of service (on-site visits, phone calls or e-mails.)

Child care health consultants support health and safety practices and environments that prevent harm and promote health and development of children as well as overall wellbeing for families and early education staff. Currently, only 17 of 51 states and territories have a statutory requirement for early childhood education programs to have child care health consultation (Honigfeld, Pascoe, Macary, & Crowley, 2017). Of these, two states only require CCHC involvement if the facility cares for sick children (Honigfeld, et al, 2017).

None of the centers in this project continued their relationship with their CCHC after the year of subsidized linkage. Some directors stated that while they found the CCHC very helpful and informative, the cost of the CCHC was prohibitive. Some said they would continue the CCHC on a fee basis if they could budget for it in the future. Other studies have shown that linkage of centers with CCHC improves health and safety compliance. ITQIP showed this is true for I/T programs too.

References

Alkon A, & Bernzweig, J. (2008). Child Care Health Linkages Project Evaluation Summary. California Childcare Health Program, UCSF School of Nursing, September 2001 – June 2004. Retrieved from http://www.ucsfchildcarehealth.org/pdfs/training_etc/Linkages_ExecSummary_FINAL.pdf

Alkon, A., Bernzweig, J., Kim, T., Mackie, J., Wolff, M., & Elman, J. (2008) Child Care Health Consultation Programs in California: Models, Services, and Facilitators. *Public Health Nursing, 25* (2), 126-139. **DOI:** 10.1111/j.1525-1446.2008.00689.x

Alkon, A., Bernzweig, J., Kim, T., Wolff, M., & Mackie, J. (2009). Child care health consultation improves health and safety policies and practices. *Academic Pediatrics, 9* (5), 366–370.

Alkon, A., Crowley, A., Benjamin Neelon, S., Hill, S., Pan, Y., Nguyen, V., … Kotch, J.B. (2014). Nutrition and physical activity randomized control trial in child care centers improves knowledge, policies, and children's body mass index. BMC Public Health, 14, 215. **DOI:** 10.1186/1471-2458-14-215. Retrieved from BioMed Central website: http://www.biomedcentral.com/1471-2458/14/215

Alkon, A, Nouredini, S., Swartz, A., Sutherland, A.M., Stephens, M., Davidson, N., & Rose, R. (2016). Management Intervention in Child Care Centers Improves Knowledge, Pest Control, and Practices. *Journal of Pediatric Health Care (in press)* http://dx.doi.org/10.1016/j.pedhc.2016.07.004

Alkon, A., Sokal-Gutierrez, K., & Wolff, M. (2002). Child care health consultation improves health knowledge and compliance. *Pediatric Nursing, 28* (1), 61-65.

American Academy of Pediatrics, American Public Health Association, National Resource Center for Health and Safety in Child Care and Early Education. 2011. *Caring for Our Children: National Health and Safety Performance Standards; Guidelines for Early Care and Education Programs (3rd ed.).* Elk Grove Village, IL: American Academy of Pediatrics; Washington DC: American Public Health Association.

American Academy of Pediatrics, American Public Health Association, National Resource Center for Health and Safety in Child Care and Early Education. 2013. *Stepping Stones to Caring for Our Children: National Health and Safety Performance Standards: Guidelines for Early Care and Education Programs (3rd ed).* Elk Grove Village, IL: American Academy of Pediatrics; Washington DC: American Public Health Association.

Aronson, S. (Ed). (2012). *Healthy Young Children* (5th ed.). Washington D.C.: The National Association for the Education of Young Children.

Aronson, S. (Ed). (2014). *Model Child Care Health Policies* (5th ed.) PA Chapter American Academy of Pediatrics. Elk Grove, Ill.: American Academy of Pediatrics. Website:

Aronson, S and Shope, T. (Eds.) (2016). *Managing Infectious Diseases in Child Care and Schools, A Quick Reference Guide* (4th ed.). East Grove Village, Ill.: The American Academy of Pediatrics.
http://www.ecels-healthychildcarepa.org

Banghart, P., & Kraeder, J.P., (2012, March). What Can CCDF Learn from the Research on Children's Health and Safety in Child Care? *Urban Institute Brief #03*. Retrieved from Urban Institute website: http://www.urban.org/publications/412579.html

Carabin, H., Gyorkos, T., Soto, J., Joseph, L., Payment, P., Collet, J.P. (1999). Effectiveness of a Training Program in Reducing Infections in Toddlers Attending Day Care Centers**.** *Epidemiology, 10* (3), 219-227.

Cole, PS. (2008). Child Care Health Consultation Improves Health and Safety Practices and Environments in Early Education Settings. Indiana Institute on Disability and Community.

Crowley A. (2006) Improving Child and Family Health through Child Care Health Consultation. Executive Summary. Beatrice Renfield-Yale School of Nursing Clinical Research Initiatives Fund. Yale University School of Nursing.

Fiene, R. (2002). Thirteen Indicators of Quality Child Care: Research Update. Washington, D.C.: Health Resources and Services Administration/Maternal and Child Health Bureau, U.S. Department of Health and Human Services and the Office of the Assistant Secretary for Planning and Evaluation.

Garcia, J.L., Heckman, J.J., Leaf, D.E., Padros, M.J. (2016) The life-cycle benefits of an

influential early childhood program. Working paper 2016-035. Chicago, Il: University of Chicago. Retrieved from https://heckmanequation.org/resource/research-summary-lifecycle-benefits-influential-early-childhood-program/

Harms, T., Cryer, D., Clifford, R., (2006). Infant/Toddler Environmental Rating Scale, Revised Edition, Frank Porter Graham Child Development Institute, the University of North Carolina at Chapel Hill. New York: Teachers College Press.

Honigfeld, L., Pascoe, T., Macary, S., Crowley, A. (2017). Promoting children's health in early care and education settings by supporting health consultation. *Impact.* Connecticut: Child Health and Development Institute of Connecticut.

Isbell, P., Kotch, J., Savage, E., Gunn, E., Lu, L., & Weber, D. (2013). Improvement of child care programs' policies, practices, and children's access to health care linked to child care health consultation. *NHSA Dialog: A Research to Practice Journal*, 16(2), 34–52

Kotch, J. B. (2002). The Quality Enhancement Project for Infants and Toddlers: Executive Summary. Chapel Hill, NC: University of North Carolina at Chapel Hill.

Kotch, J. B., Isbell, P., Weber, D. J., Nguyen, V., Savage, E., Gunn, E., et al. (2007). Hand-washing and diapering equipment reduces disease among children in out-of-home child care centers. *Pediatrics*, 120, e29–e36.

Laughlin, L., (2013). Who's Minding the Kids? Child Care Arrangements: Spring 2013. *Current Population Reports*, P70-135. Washington, D.C.: U.S. Census Bureau. Retrieved from https://www.census.gov/prod/2013pubs/p70-135.pdf

Moon R & Oden R. (2005) Back to Sleep: Can We Influence Child Care Providers. *Pediatrics*, *112* (4), 878-882.

Organizational Research Services and Geo Education & Research, (2007, March) Child Care Health Consultation: Evidence Based Effectiveness. Data from Healthy Child Care Washington Evaluation Report 2003-2007. Washington State Department of Health, 2007, 29. Seattle Washington.
Retrieved from
https://www.napnap.org/sites/default/files/userfiles/membership/CCS_SIG_Evidence_%20Based_%20CCHP.pdf

PA Office of Child Development and Early Learning. (2010) Demonstrating Quality: Pennsylvania Keystone STARS 2010 Program Report. Retrieved from http://www.ocdelresearch.org/Reports/Forms/AllItems.aspx?RootFolder=%2FReports%2FKeystone%20STARS&FolderCTID=0x01200092EA27E29EEE3E4AAE2D4C5508AC9E5A&View={5EEC6855-F8A8-486E-B6E0-FE6B9FDEBE2E}

Pennsylvania Department of Human Services, (2008). 55 Pa Code, Chapter 3270, Child Care Regulations; 3270.131(a)(5) Retrieved from http://www.dhs.pa.gov/provider/earlylearning/childcareregulations/

Pennsylvania Key – Program Quality Assessment Team (2016). 2015-2016 Environmental Rating Scale Reports: ECERS-R, ECERS-3, ITERS-R.

Pacific Research and Evaluation, (2008). *Improving the health and safety of children in Oregon's child care: Implementation and outcomes of Oregon Child Care Health Consultation Program.* Department of Human Services, Public Health Division, Office of Family Health, Portland, Oregon

Pacific Research and Evaluation, (2007). *Evaluation of the Child Care Health Consultation Demonstration Program: Phase IV Final Report* 2007. Department of Human Services, Office of Family Health, Portland, Oregon.

Ramler, M., Nakatsukasa-Ono, W., Loe, C., & Harris, K. (2006, August). The influence of child care health consultants in promoting children's health and well-being: A report on selected resources. United States: Maternal Child Health Bureau, August 2006. Education Development Center, Inc. Healthy Child Care Consultant Network Support Center, Newton, MA and CHT Resource Group, Oakland, CA.

Roberts, L., Smith, W., Jorm, L., Patel, M., Douglas, R.M., & McGilchrist, C. (2000). Effect of Infection Control Measures on the Frequency of Upper Respiratory Infection in Child Care: A Randomized, Controlled Study. *Pediatrics, 105*(4), 738-742.

Roberts, L., Smith, W., Jorm, L., Patel, M., Douglas, R.M., & McGilchrist, C. (2000). Effect of Infection Control Measures on the Frequency of Diarrheal Episodes in Child Care: A Randomized, Controlled Study. *Pediatrics, 105*(4), 743-746.

Zaslow M., Tout K., & Halle T. *On-Site Approaches to Quality Improvement in Quality Rating and Improvement Systems: Building on the Research on Coaching,* Research-to-Policy, Research-to-Practice Brief OPRE 2012-40. Washington, DC: Office of Planning, Research and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services)

Figure 1: EVALUATION PLAN LOGIC MODEL

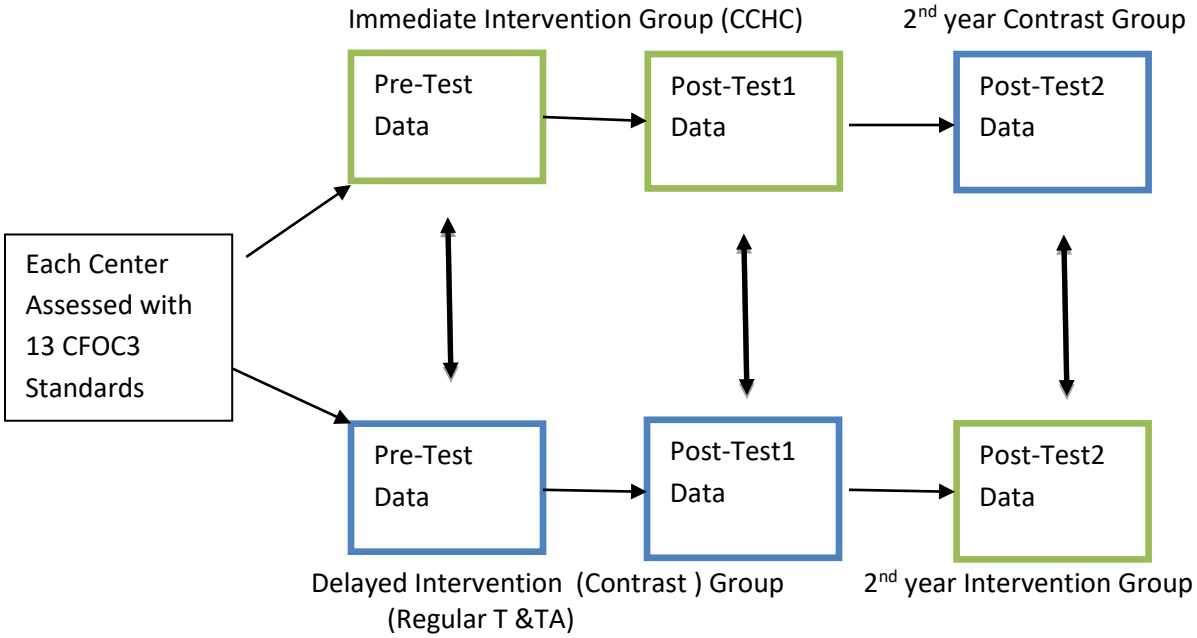

Figure 2: Crossover Comparison Results

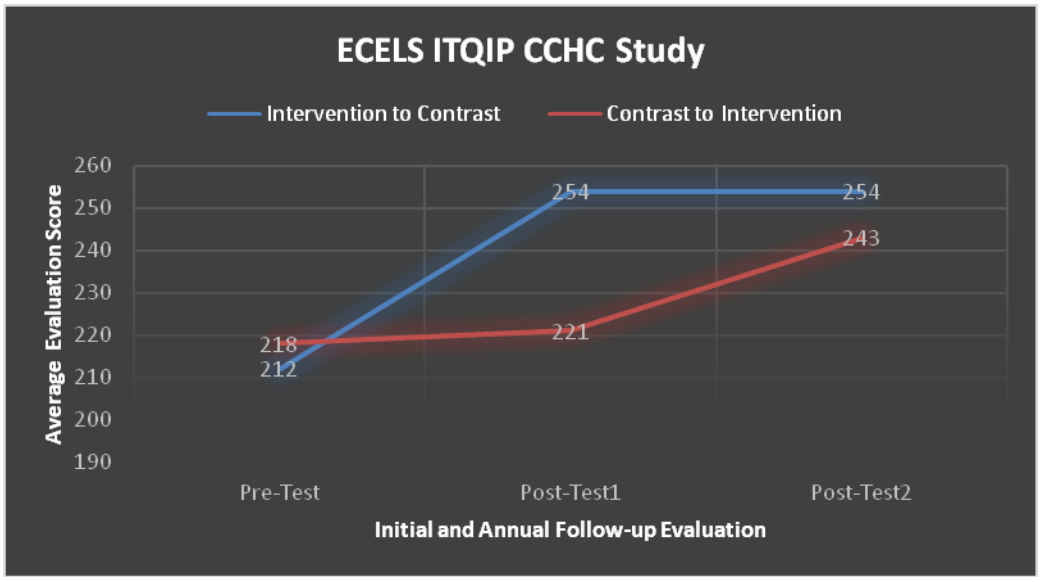

Table 1: *CFOC3* Standards Chosen for ITQIP

1.4.5.2 - Child Abuse and Neglect Education
3.4.4.1 - Recognizing and Reporting Suspected Child Abuse, Neglect, and Exploitation
2.1.2.1 - Personal Caregiver/Teacher Relationships for Infants and Toddlers
2.2.0.2 - Limiting Infant/Toddler Time in Crib, High Chair, Car Seat, and other restraining equipment
3.1.3.1 - Active Opportunities for Physical Activity
3.1.4.1 - Safe Sleep Practices and SIDS Risk Reduction
3.2.1.4 – Diaper Changing Procedure
3.2.2.1 – Situations that Require Hand Hygiene
3.2.2.2 – Handwashing Procedure
3.6.3.3 - Training of Caregivers/Teachers to Administer Medication
3.5.0.1 - Care Plan for Children with Special Health Care Needs
5.4.5.2 - Cribs
7.2.0.1 - Immunization Documentation

Table 2: Care Plan Components Evaluated for Children with Special Needs

	Fourteen components specified in the *CFOC3* standard 3.5.0.1. (AAP et al, 2011) and a 15th required by Pennsylvania child care regulation
1	A list of the Child's Diagnoses
2	Contact Information for the child's health care provider and any subspecialists
3	Medications to be administered on a scheduled basis
4	Medications to be administered in an emergency with clearly stated signs and symptoms in lay language about when to give the medication
5	Procedures to be performed while in care
6	Allergies
7	Diet modification that the child requires
8	Activity modifications
9	Environmental modifications
10	Triggers that cause a reaction to avoid
11	Symptoms for caregivers/teachers to observe
12	Behavioral modifications beyond those needed for a typically developing child
13	Emergency response plans for a facility emergency and if the child has an emergency event
14	Special skills training and education required and provided for the staff
15	Health Care Provider signature (required by PA regulation)

Table 3: Criteria for Scores Assigned to Items on the Evaluation Tool

0: Never meets item
1: Partly (<50%) meets item
2: Mostly (= or >50%) meets item
3: Fully (100%) meets the item
NA: Not Applicable
NOp: Not Observed or No Opportunity to obtain data
DK: Don't Know (interviewee response)

Table 4: Topic Areas and Number of Items to Score per Topic

Abbreviation	Topic Areas	Number of Items to Score per Topic*
CA	Preventing Child Abuse	13
PR	Personal Relationships	9
LA	Limited Physical Activity of Infants	3
AO	Active Opportunity for Physical Activity	22
SS	Safe Sleep Practices/ SIDS Prevention	19
MA	Medication Administration	8
DC	Diaper Changing Procedure	16
HH	Hand Hygiene	8
IM	Immunization Documentation	3
SN	Care Plans for Children with Special Needs	5

* See the narrative for an item by item explanation of those items with significance levels (p values) based upon the t-tests performed on each item.

Table 5: Location and Retention of Recruited Centers

REGION of PENNSYLVANIA	IMMEDIATE INTERVENTION GROUP			DELAYED INTERVENTION GROUP		
	Centers Recruited	**Centers Dropped Out**	**Centers Completed**	**Centers Recruited**	**Centers Dropped Out**	**Centers Completed**
SOUTHWEST REGION (Pittsburg Metropolitan Area)	1	0	1	3	1	2
SOUTH CENTRAL REGION (Harrisburg Metropolitan Area)	4	1	3	2	1	1
NORTHEAST REGION (Allentown/Bethlehem/Scranton)	3	0	3	4	0	4
SOUTHEAST REGION (Philadelphia Metropolitan Area)	8	2	6	7	1	6
Total	16	3	13	16	3	13

Table 6: *CFOC3* Topics Chosen by Centers by Intervention Group

***CFOC3* Topics**	**Number of Centers in Immediate Intervention Group that chose each topic**	**Number of Centers in Delayed Intervention(Contrast) Group that chose each topic**
Safe Sleep Practice	11	11
Medication Administration	10	6
Child Abuse Prevention	6	1
Care Plans for Children with Special Needs	5	8
Diaper Changing Procedure	4	4
Limited Physical Activity of Infants	2	1
Hand Hygiene	2	5
Immunization	1	0
Personal Relationships	0	1
Active Opportunity for Physical Activity	0	4

Table 7: Quantitative Results of the Evaluation from the Pre-Test to Two Post-Tests

	Intervention Group				Delayed Intervention(Contrast) Group			
	Range	**Average**	**%**	**Possible Total**	**Range**	**Average**	**%**	**Possible Total**
Pre-Test	175-267	212*	66%	318	164-271	218	68%	318
Post-Test1	213-297	254*/***	79%	318	149-257	221**/***	69%	318
Post-Test2	137-286	254	79%	318	170-283	243**	76%	318

*Statistically significant change ($t = -4.62$; $p \leq .0001$) from Pre-Test to Post-Test1 for the Immediate Intervention Group after the intervention of a one year linkage with a CCHC.

**Statistically significant change ($t = -1.80$; $p \leq .08$ from Post Test1 to Post-Test2 for the Delayed Intervention Group after the intervention of one year of CCHC linkage.

***Statistically significant change ($t = -3.46$; $p < .002$) for Post Test1 between the Immediate Intervention Group and the Delayed Intervention (Contrast) Group.