ICHQ Implementation and Costs of High Quality EARLY CARE & EDUCATION

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Early Childhood Research Brief

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Shannon Monahan, Gretchen Kirby, and Katie Gonzalez

Developing Reliable and Valid Measures of Implementation to Support High Quality in Early Care and Education Centers

Measuring quality in early care and education (ECE) centers is often focused on children's experiences in the classroom. ECE researchers, federal and state administrators, and center directors are increasingly interested in understanding how decisions made at the center-level can support what happens in the classroom.

In the **Assessing the Implementation and Costs of High Quality Early Care and Education**, or **ICHQ** (pronounced I-check), project we set out to develop two sets of center-level measures to capture (1) implementation of activities that can support quality in ECE centers that serve children from birth to age 5 (not yet in kindergarten) and (2) the costs to provide care and services within the resources they have available. Implementation measures summarize what a center does to support quality, including the combination of structural features (for example, teacher–child ratios, group size, and staff qualifications) and adopted practices (for example, use of a published curriculum or child assessment tool), as well as how features and practices are supported. Cost measures estimate the amount and allocation of resources needed to support the ECE services a center provides, including how staff use their time. The combined ICHQ implementation and cost measures will help center administrators and policymakers connect decisions about day-to-day operations to the larger question of how to allocate limited resources to provide high quality ECE.

This brief, part of a series of research briefs presenting findings from a multi-case study of 30 ECE centers, focuses on the psychometric properties of the ICHQ implementation measures. The multi-case study helped us develop draft measures and explore how well they are working to summarize implementation, estimate costs, and identify ways centers can achieve quality. The ICHQ measures are being further tested and validated in a field test with a larger sample of centers in 2021.

Psychometric properties show how reliable and valid a measure is based on the purposes for which it is designed and used.

Reliability indicates whether a measure produces consistent results and how dependable a measure is for the purposes for which it is used.

Validity is the degree to which a measure accurately captures the concept that it is designed to measure and is appropriate for the purpose it is being used.

To be useful, relevant, and practical, the implementation measures need to use items that can be captured consistently across a range of center-based ECE settings and have good psychometric properties. The multi-case study included centers with varied characteristics, including licensed capacity (a proxy for size), ages of children served, mix of funding sources,

profit status, and Quality Rating and Improvement System (QRIS) ratings. This range of ECE centers helped us explore whether the draft implementation measures appear to be reliable and valid.

The ICHQ implementation measures demonstrate reliability

We developed and tested draft implementation measures for five key functions, or areas, of ECE center operations that contribute to high quality care. Each of the five key functions are defined by a specific set of activities and practices that allows us to measure implementation and costs for each function distinctly. All ECE centers carry out activities in each key function to provide services to young children and their families, but to varying degrees.

The key functions include: (1) Structural Supports for Instruction and Caregiving; (2) Instructional Planning, Coordination, and Child Assessment; (3) Workforce Development; (4) Child and Family Support; and (5) Center Administration and Planning.

To determine the reliability of the implementation measures for each key function, we examine the measures' internal consistency—whether the items work well together to measure implementation of each key function with a relatively small amount of measurement error. Reliability above 0.70 suggests that the items in each of the key functions are internally consistent.[1] We conducted a confirmatory factor analysis that looks at the relationships among items of a measure. Reliability—as captured in reliability coefficients (McDonald's omega)—for the measure of each key function ranges from 0.698 to 0.939.

Number of items and reliability of implementation measures for each key function

Key function	Number of items	Reliability coefficient (McDonald's Omega)
Structural Supports for Instruction and Caregiving	15	0.804
Instructional Planning, Coordination, and Child Assessment	19	0.698
Center Administration and Planning	20	0.903
Workforce Development	21	0.857
Child and Family Support	18	0.939

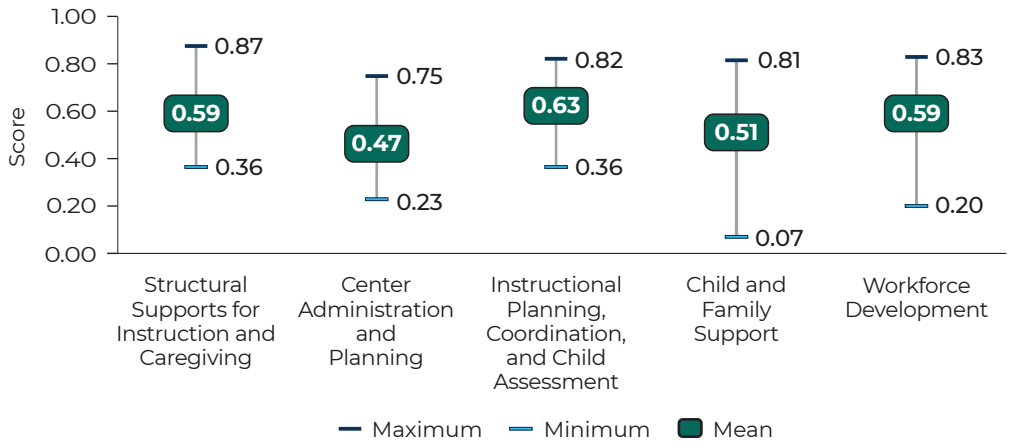
The ICHQ implementation measures capture meaningful variation among centers

The ICHQ implementation measure scores for each key function vary substantially across the 30 centers. This variation suggests that the implementation measures capture differences in the structural features and adopted practices that centers have in place to support quality and in the ways they carry out features and practices. For example, we might expect the widest range in scores on the implementation measure for the Child and Family Support function, because centers can differ in the number and types of services they provide or how they connect children and families with support needs beyond children's learning and development. As you can see in the chart below, the ICHQ implementation measure for this function indeed shows the widest range in scores from 0.07 to 0.81. In contrast, we see the narrowest range in scores on the implementation measures for the two functions that are most focused on features and practices that affect

Implementation measure scores range from 0 to 1 for each of five key functions. A higher value, or score, (closer to 1) indicates stronger structural features of care, intentional practices that are associated with higher quality, and attention to implementation drivers that are typically present in programs that produce positive outcomes.

classrooms: (1) Structural Supports for Instruction and Caregiving and (2) Instructional Planning, Coordination, and Child Assessment. This might be because most centers in our sample must meet Head Start, state prekindergarten, QRIS, or other standards that reflect similar elements.

Range of scores on the implementation measures for each key function

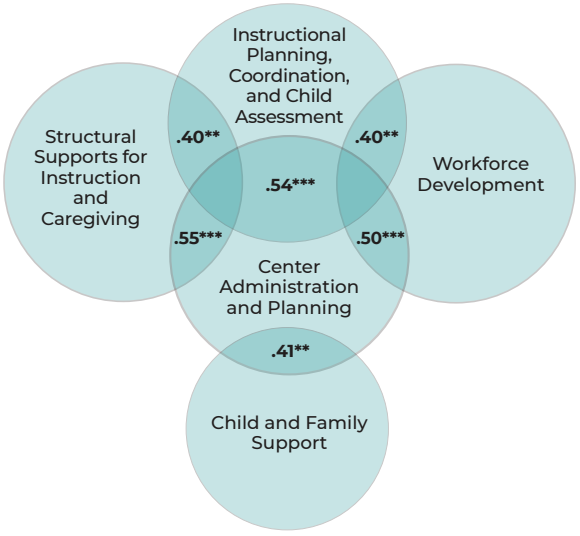


The implementation measures for the key functions are related, but each provides unique information

We see positive, significant relationships among the implementation measures for each of the key functions. The positive relationships between key functions (captured by correlations) suggest that centers that have strong implementation of one key function tend to have strong implementation of other key functions, as well. For example, Instructional Planning, Coordination, and Child Assessment is significantly related to both Structural Supports for Instruction and Caregiving and Workforce Development. These relationships indicate that centers that implement practices that support use of a published curriculum, provide teachers with planning time, and have intentional processes for developmental screenings and child assessments also tend to have strong structural features of care and provide strong professional development supports and training to teachers. Center Administration and Planning is positively and significantly related to all other four key functions, which suggests that this key function is important in supporting strong implementation across all functions.

The correlations between any two key function implementation measures are generally moderate (between 0.30 and 0.60), indicating that although the measures are related, the implementation measure of each key function is unique. Together, each of the implementation measures contributes information to explore how different functions can influence center quality.

Implementation measures are related across the five key functions



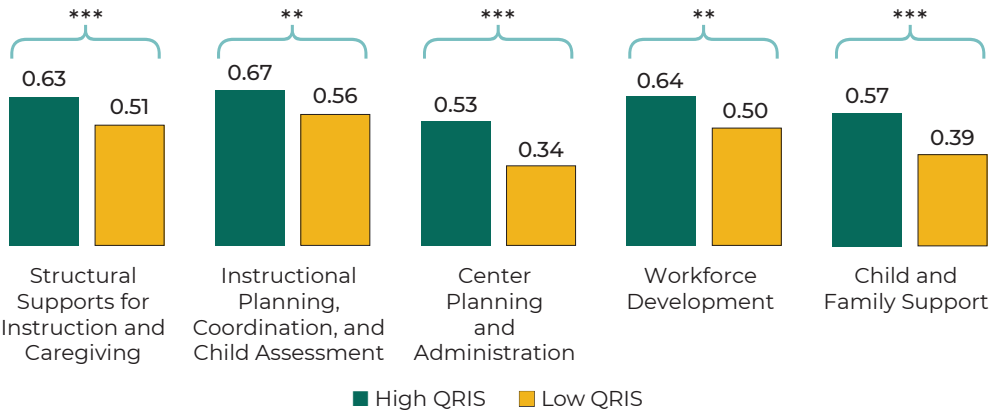
** Significant at the 0.05 level.
*** Significant at the 0.01 level.

The ICHQ implementation measures are related to center characteristics and quality ratings in ways we would expect, providing preliminary evidence of validity

We examined validity of the implementation measures based on patterns with observable center characteristics, such as QRIS ratings and funding sources. In our ICHQ sample, centers with high QRIS ratings have higher scores on the implementation measures than centers with low QRIS ratings, on average, for each key function.[2] The positive and statistically significant relationships between high QRIS ratings and the implementation measure of each key function are consistent with our expectations because the implementation measures are intended to capture what a center does to support quality and how it implements features and practices.[3] There is some overlap in the constructs reflected in QRIS ratings and the implementation measures. However, the implementation measures capture more comprehensive detail about key functions than QRIS ratings do.

We also found that centers that rely mostly on Head Start or state prekindergarten funding or on mixed funding have higher scores on the implementation measures, on average, than centers that rely largely on private tuition or on child care subsidies (not shown). This finding suggests higher levels of implementation among these centers, perhaps due to the more stringent standards that participation in Head Start and state prekindergarten programs require.

Relationship between QRIS ratings and implementation measures



Note: Centers are categorized as having high or low QRIS ratings based on the requirements for the different rating levels in each of the three states in the multi-case study.

** Significant at the 0.05 level.

*** Significant at the 0.01 level.

Next steps for validation and uses of the ICHQ implementation measures

We found initial evidence that the implementation measures are working as intended to capture *what* centers do to support quality and *how* they are supporting and implementing quality features and practices. The implementation measures appear reliable and valid based on preliminary data from a small set of centers. This developmental work has helped us to identify items that have a high value in measuring each key function, with sound statistical properties given the sample size. We are further testing the psychometric properties of the implementation measures in a field test with a larger sample of centers in 2021, and assessing them against an externally validated measure that captures similar constructs.

Practitioners could use the ICHQ implementation measures to understand how centers implement the five key functions to support high quality ECE and point to areas that could improve or might benefit from technical assistance. The ICHQ implementation measures can also provide policymakers with a framework for identifying policy or funding gaps that low scores on the implementation measures might signal or enable them to compare or evaluate quality initiatives based on patterns in scores of the measures. As the ICHQ implementation measures are tested further and used more widely, benchmarks could emerge that signal the tipping point at which scores on the implementation measures for a key function predict center quality outcomes.

Endnotes

[1] Nunnally, J. C., and I. H. Bernstein. *Psychometric Theory*. New York, NY: McGraw Hill, 3rd ed, 1994.

[2] High QRIS generally includes the top one or two rating levels, depending on the total number of rating levels and the definitions of high quality set by each of the three states in the multi-case study. We excluded the first rating level from the low category in two of the three states because there was no assessment or gauge of quality made at entry. We also excluded middle rating levels in two of the states to get a better distinction between high and low quality based on the QRIS requirements.

[3] The implementation measures capture information about activities that, according to implementation science, form the core of effective implementation for any program or practice: (1) recruitment, hiring and selection of practitioners with the required skills and competencies; (2) selection and use of tools that clearly convey the key concepts, principles, procedures, and practices of an innovation; (3) training that delivers content knowledge to practitioners, (4) technical assistance (TA) or coaching that includes observation and feedback, and (5) a quality assurance (QA) and quality improvement (QI) process. These activities are measured, as applicable, within each of the key functions.

About the Project

OPRE sponsored the ICHQ project to create measures of implementation and costs of providing ECE services at centers for children from birth to age 5. The project produced measures to examine how differences in what a center does and how resources are used influence quality. Products include a literature review and a methods paper that describes how we developed draft measures through a multi-case study.

This brief is part of a series of research briefs summarizing findings from the ICHQ multi-case study that collected data from 30 ECE centers between October 2017 and June 2018 to develop draft measures. Subsequent products from the ICHQ project will describe findings from a 2021 field test in which we are testing and validating the measures in a purposive sample of 80 centers in four states and will further specify uses of the measures for research and practice.

Project Officers: Meryl Barofsky and Ivelisse Martinez-Beck
Office of Planning, Research, and Evaluation
Administration for Children and Families
U.S. Department of Health and Human Services

Project Director: Gretchen Kirby
Mathematica
1100 First Street, NE, 12th Floor
Washington, DC 20002-4221

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