

Child Care Workforce Qualifications											
Title	Author(s)	Year	Publication Source	Sample Size (N)	Sample Composition	Data Source	Independent Variable(s)	Dependent Variable(s)	Summary of Findings	Limitations to Causal Inference	Exclusion Criteria
Child care subsidy and quality revised	Antle, B., Frey, A., Barbee, A., Frey, S., Grisham Brown, J., & Cox, M.	2008	Early Education and Development	110	110 childcare centers (47 infant/ toddler classrooms, 44 preschool classrooms)	Telephone interview of child care program directors, teacher survey to assess structural quality, and direct classroom observations to assess process quality	<ul style="list-style-type: none"> Teacher salaries (average beginning hourly wage) Teacher education (attainment, categorical) 	<ul style="list-style-type: none"> Childcare quality (ITERS-R, ECERS-R, ELLCO) 	<ul style="list-style-type: none"> Positive, statistically significant correlation between wages and ITERS-S, ECERS-R, and ELLCO Positive, significant association between teacher education and ECERS-R, ELLCO Best predictor of ITERS was teacher salary Best predictors of ECERS were subsidy density and teacher education Neither salary nor education predicted ELLCO scores. 	Unclear controls in regression models, teacher salaries collected at program level (not classroom), cross-sectional	
Raising teacher education levels in Head Start: Exploring programmatic changes between 1999 and 2011	Bassok, D.	2013	Early Childhood Research Quarterly	12,700 - 23,800 observations (2,283 programs)	Head start programs between 1999-2011 in the US (excluding home-based care, those with no funded enrollment, those with no teachers)	Program Information Reports from Head Start centers	<ul style="list-style-type: none"> Teacher education (AA and above, BA and above) 	<ul style="list-style-type: none"> Health and social service provision Staffing Racial composition 	<ul style="list-style-type: none"> No evidence of a relationship between teacher education and health and social service provision Trends showed that programs with increases in teacher education were associated with increases in child-teacher ratios, turnover, and racial divergence between children and staff 		Age group focus (pre-K only)
Strengthening the early childhood workforce: How wage incentives may boost training and job stability	Bridges, M., Fuller, B., Huang, D. S., & Hamre, B. K.	2011	Early Education and Development	2,783	2,783 preschool center directors, teachers, and classroom aides (85% from preschool centers, 15% family child-care homes) from 10 counties selected to be representative of counties participating in California's Child-care Retention Incentive program, 2001-2004	Telephone interviews with staff and data from program records	<ul style="list-style-type: none"> County CRI program characteristics (stipend amount, medium and high supports, initial req., continuing eligibility req., steepness of stipend scale) Job characteristics (including base salary) 	<ul style="list-style-type: none"> Teacher training (college units completed) Turnover (center, field) 	<ul style="list-style-type: none"> Features of county programs were not associated with the number of units completed in the first year (patterns held over time) Few features of county programs were associated with the probability of staff leaving their center within 2 years of program entry, with the exception of staff in programs with medium advising and professional supports being less likely to leave (relative to low supports) Staff with higher salaries and longer tenure less likely to leave Staff with higher pay and longer tenure were less likely to leave No other program characteristics were associated with likelihood of leaving the field 	No comparison/control group	
Structural predictors of child care quality in child care homes	Burchinal, M. R., Howes, C., & Kontos, S.	2002	Early Childhood Research Quarterly	208	108 home-based providers (FCC Study) and 100 home-based providers (CA licensing Study)	Family Child Care and Relative Care Study, California licensing study	<ul style="list-style-type: none"> Ratio Group size Caregiver background (education = categorical, training = binary report of workshops outside of formal education; other variables too) 	<ul style="list-style-type: none"> Caregiver involvement scale CIS) Overall quality (Family Day Care Rating Scale FDCRS) 	<ul style="list-style-type: none"> Caregiver education did not predict FDCRS total, CIS sensitivity, or CIS detachment scores Caregiver training was statistically significantly and positively associated with FDCRS and negatively associated with CIS detachment (no significant association to CIS sensitivity) 	Observational, small sample	

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Caregiver training and classroom quality in child care centers	Burchinal, M. R., Cryer, D., Clifford, R. M., & Howes, C.	2002	Applied Developmental Science	553 classrooms, 828 children	135 infant/toddler classrooms (<30 months), 418 preschool classrooms (30 months to less than school age), and 828 children in classrooms - centers randomly selected from all centers providing full-time care for at least 11 months per year in Los Angeles, CA; Hartford-New Haven, CT; Frontal range, CO; and the Piedmont region, NC	Cost, Quality, and Child Outcomes in Child Care Centers Study, 1993 (collected from classroom observations and staff questionnaires)	<ul style="list-style-type: none"> • Training (BA in ECE, AA in ECE, ECE coursework completed at college level, CDA, workshops only/no training) • Years of experience 	<ul style="list-style-type: none"> • Structural quality (meet NAEYC child-staff ratio standards? y/n) • Process quality (ITERS/ECERS, Caregiver Interaction Scale) • Child outcomes - language comprehension (PPVT-R) 	<ul style="list-style-type: none"> • Both the highest level of training and attending workshops are associated with higher quality classrooms. • Kids' PPVT scores varied with teacher education - PPVT scores were significantly higher when comparing teachers w/BA or BS degrees in ECE to the other levels of education • Among informal training, only training at community workshops was associated with higher PPVT scores 	Correlational observational and point-in-time	
Relating quality of center-based child care to early cognitive and language development longitudinally	Burchinal, M., R., Roberts, J. E., Riggins, R., Zeisel, S. A., Neebe, E., & Bryant, D.	2000	Child Development	89	89 children between ages 1 and 11 months who attended child care for at least 30 hours per week, from 27 different child care centers	Direct child assessments, classroom observation and assessment, home observation and assessments	<ul style="list-style-type: none"> • Process quality (ITERS, ECERS) • Structural quality (teacher education in years, class size, # adults, adult-child ratio) 	<ul style="list-style-type: none"> • Cognitive development (Bayley Scales of Infant Development) • Language development (Sequenced Inventory of Communication Development) • Communication skills (Communication and Symbolic Behavior Scales) 	<ul style="list-style-type: none"> • Teacher education not significantly related to children's developmental outcomes for all children • Teacher education more strongly linked to girls' than boys' MDI and RCA scores • Classrooms with teachers with more education showed greater gains in expressive language over time • Teacher education not significantly associated with children's general communication skills 	Small sample (especially for subgroup analyses)	
The effect of education on child care teachers' beliefs and classroom quality: Year one evaluation of the TEACH Early Childhood Associate Degree Scholarship Program	Cassidy, D. J., Buell, M. J., Pugh-Hoese, S., & Russell, S.	1995	Early Childhood Research Quarterly	34	34 teachers (19 w/scholarships, 15 comparison), participants and comparison teachers recruited from the same center when possible	Classroom assessments, self-report questionnaires	<ul style="list-style-type: none"> • TEACH Early Childhood Associate Degree Scholarship Program participation 	<ul style="list-style-type: none"> • Quality (ECERS/ITERS including appropriate caregiving and developmentally appropriate activities subscales, Teacher Beliefs Scale, and the Instrumental Activities Scale) 	<ul style="list-style-type: none"> • Significant differences in the pre- to post-test gains between the two groups for the ITERS/ECERS and the two subscales • There was also a statistically significant gain in the scores of the scholarship group on the ECERS/ITERS, developmentally appropriate activities subscale, and the TBS • Additional analyses suggest that there is a significant association between teacher scholarships and increases in ECERS and ITERS ratings, as well as on the appropriate caregiving subscale 	Small sample (19 in treatment, 15 in comparison)	

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Do regulable features of child-care homes affect children's development?	Clarke-Stewart; Vandell; Burchinal; O'Brien; McCartney	2002	Early Childhood Research Quarterly	Between 146 and 172 across data collection periods	Children recruited from hospitals during the first 11 months of 1991, eligible participants were in a child-care homes in which at least two children and the care provider received payment for child care; 164 children at 15 months, 172 at 24 months, and 146 at 36 months	NICHD SECC	<ul style="list-style-type: none"> • Nonregulable features (caregiver's attitude, experience, age, beliefs about childcare, mental health, and presence of own children) • Regulable features (caregiver's education, caregiver training, number of children in home, and licensing) 	<ul style="list-style-type: none"> • Observed quality of care (ORCE) and environment (CC-HOME) • Child cognitive (Bayley MDI), behavioral, and social outcomes (CBCL, ASBI) 	<ul style="list-style-type: none"> • Observed quality of care higher when caregivers were more educated, had higher levels of specialized training, and had received child-related trainings in the previous year • Education and training associated with improved cognitive development • No effect on behavioral and social outcomes 	Observational, small sample for each age (pooled sample at 3 ages)	
Are teachers' education, major, and credentials related to classroom quality and children's academic gains in pre-kindergarten?	Early, D. M., Bryant, D. M., Pianta, R. C., Clifford, R. M., Burchinal, M. R., Ritchie, S., Howes, C., & Barbarin, O.	2006	Early Childhood Research Quarterly	237 classrooms, 939 children	6 states that had committed significant resources to pre-K initiatives in 2001, serving more than 15% OF 4-year-olds in state funded programs, randomly selected centers/teachers/ children within the sample	National Center for Early Development and Learning's (NCEDL) Multi-State Study of Pre-Kindergarten	<ul style="list-style-type: none"> • Teacher education (years of education, highest degree, BA vs. no BA) 	<ul style="list-style-type: none"> • Classroom quality • Early childhood environment • CLASS • Pre-academic skills • PPVT-III • Woodcock-Johnson III test • Identifying letters and numbers and colors 	<ul style="list-style-type: none"> • Teachers education associated with gains in math scores across the Pre-K year • CDA credential associated with gains in children's basic skills • Null effects on classroom quality or other academic gains for children 		Age group focus (pre-K only)
Teachers' education, classroom quality, and young children's academic skills: Results from seven studies of preschool programs	Early, D. M., Maxwell, K. L., Burchinal, M., Alva, S., Bender, R. H., Bryant, D., ... & Zill, N.	2007	Child Development	7	7 studies: EHS Follow-Up, Head Start FACES 2003, Georgia Early Care Study, More at for Evaluation, NCEDL Multi-State Study of Pre-k and Study of State-Wide Early Education Programs, NICHD SECCYD, Preschool Curriculum Evaluation Research Program	Datasets of 7 studies that contain data on teacher ed, classroom quality data, and children's academic outcomes (with pretest scores)	<ul style="list-style-type: none"> • Highest level of education (categorical) • Bachelor's degree (binary) • Major (ECE/child dev. vs. other ed., non-ed.) 	<ul style="list-style-type: none"> • Observed classroom quality (ECERS-R, Observational Record of the Caregiving Environment) • Receptive language (PPVT, Preschool Language Survey, Reynell Developmental Language Scale) • Pre-reading skills (WJ-R, WJ-III Letter-Word Identification) • Early math skills (WJ-R, WJ-III Applied Problems, Bracken - School Readiness Composite) 	<ul style="list-style-type: none"> • Overall, studies provide no evidence of a consistent relationship between teachers' education/major and classroom quality or children's academic gains • Some positive associations, but no clear pattern emerged 		Age group focus (pre-K only)

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Education of staff in preschool aged classrooms in child care centers and child outcomes: A meta-analysis and systematic review.	Falenchuk, O., Perlman, M., McMullen, E., Fletcher, B., Shah, P. S.	2017	Plos ONE	39	Cohort, cross-sectional, and longitudinal studies reporting on associations between staff education in preschool classrooms (centers) to child outcomes, fall 2013 and spring 2014	Data from 39 studies that used child pre-scores as a covariate, used gain scores in analyses, or in which children had been in the program for a period of time prior to assessment (where multiple studies used the same dataset, the study with the largest sample size was included)	• ECE staff education	Domains • Approach to learning • Cognitive • Combination of domains • Language • Math • Physical health and development • Social-emotional behaviors	<ul style="list-style-type: none"> • Mixed evidence for child cognitive outcomes • Mostly null evidence for language outcomes • Mostly null evidence for math outcomes • Mixed results for social emotional and positive behavior outcomes 	Draws on mostly observational studies; mostly focused on preschool-aged children, meta analysis is limited to a small number of outcomes in a small number of studies, otherwise primarily a literature review.	
Evaluation of Comprehensive Approaches to Raising Educational Standards (CARES) Plus Program, 2011–2016	First5 California	2017	First5 California	4,300	CARES plus participants and educators (for ages 0-5)	CARES survey, CLASS scores	<ul style="list-style-type: none"> • CDE-approved training • Higher education coursework • MTP coaching 	<ul style="list-style-type: none"> • CLASS scores (emotional support, classroom organization, instructional support) 	<ul style="list-style-type: none"> • Training showed improvements in emotional support and classroom organization • Higher education had no differences • Coaching had improvements across all three domains (varied by number of cycles complete, years of experience, education, and primary position) 	Pre-/post-model, excluded	
Predictors of quality and child outcomes in family child care settings	Forry, N., Iruka, I., Tout, K., Torquati, J., Susman-Stillman, A., Byrant, D., & Daneri, M. P.	2013	Early Childhood Research Quarterly	182	QUINCE providers serving children between ages of 2.5 and 5 years	QUINCE study (provider survey, classroom observation, child assessments)	<ul style="list-style-type: none"> • Providers' personal/professional resources • Stress • Attitudes • Believes • Practices 	<ul style="list-style-type: none"> • Quality of care • Child outcomes 	<ul style="list-style-type: none"> • Evidence suggests that there is a correlation between provider characteristics related to personal/professional resources and stress, and between providers' personal attitudes/ beliefs and observed classroom quality measures • Also found a relationship between observed quality/providers' child-centered beliefs/perceptions of job demands and child developmental outcomes 	Correlational, not looking at the outcome of the QUINCE intervention, pooling participants and control	
Center-based care for young children: Examining predictors of quality	Ghazvini, A., & Mullis, R. L.	2002	The Journal of Genetic Psychology	75	75 parents of children 15-36 months and their caregivers from 13 child care centers	Caregiver questionnaires, observations of caregiving behavior and quality of care, parent questionnaire	<ul style="list-style-type: none"> • Caregiver characteristics (including education and years of experience, social support, perceived stress, job) characterization) • Conditions of caregiving/structural quality of care (including weekly salary and benefits, among others) 	<ul style="list-style-type: none"> • Process quality of care: restrictive practices (Child-Rearing Practices Report) and sensitivity (Arnett Caregiver Interaction Scale), global quality of care (ITERS) 	<ul style="list-style-type: none"> • Process quality and structural quality were correlated • Higher salaries and specialized training correlated with more sensitive and nurturant subscale scores, and lower punitive, detached, and restricted subscale scores. • Specialized training negatively associated with restrictiveness and positively associated with global quality 	Study design observational and correlational, cross-sectional, very small sample (75), unclear controls in models	

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The impact of Child Development Associate training on the beliefs and practices of preschool teachers	Heisner, M. J., & Lederberg, A. R.	2011	Early Childhood Research Quarterly	126	126 preschool staff (76 enrolled in CDA classes, 50 comparison)	Staff in center-based setting w/no prior college degree or ECE courses in last ten years), CDA population sampled from programs offering weekend classes not req. college enrollment, comparison selected from programs where CDA participants worked	<ul style="list-style-type: none"> CDA training participation 	<ul style="list-style-type: none"> Teacher beliefs and practices (Teacher Beliefs and Practices Survey - 3-5 year olds, Beliefs and Instructional Activities subscales; Early childhood survey of beliefs and practices) 	<ul style="list-style-type: none"> CDA group significantly increased their scores on the TBPS-Beliefs and TBPS-Practices over time, but the comparison group did not No significant effects seen for ECSBP-Beliefs or Practices 	Small sample size; intervention is participation in CDA training, not completion; outcome is not observed quality but survey about beliefs/practices	
Retention of staff in the early childhood education workforce	Holochwost, W. J., DeMott, K., Buell, M., Yannetta, K., & Amsden, D.	2009	Child Care and Youth Forum	844	844 staff from licensed early care and education programs (425 center-based, 170 preschool, 72 school age, 26 head-start, 151 family care)	Early Care and Education Workforce Survey	<ul style="list-style-type: none"> Staff/personal factors Environmental factors 	<ul style="list-style-type: none"> Length of time planning to stay in the field 	<ul style="list-style-type: none"> Teachers with lower educational attainment report they intend to remain in the field longer than those with a bachelor's or higher Environmental factors of interest: Health insurance, disability insurance, and a pension plan were all associated with significantly higher mean scores on educators' intent to remain in the field Mean salary was not linked to intent to remain in the field 	Based on intention to stay; cross-sectional	
Children's experiences in center-based child care as a function of teacher background and adult:child ratios	Howes, C.	1997	Merrill-Palmer Quarterly	1,065 classrooms; 1,580 children	655 classrooms and 760 children from CQO (full-day licensed centers, children eligible to begin kindergarten in the fall of '94); N = 410 classrooms and 820 children in FL QIS (mix of programs, selected based on % subsidy recipient)	Cost, Quality, and Outcome Study (CQO), Florida Quality Improvement Study (FL QIS)	<ul style="list-style-type: none"> CQO: teacher education (HS, some college, AA, BA+) crossed w/ specialized training (workshops, AA in ECE, BA+ in ECE) FL QIS: same as above, but CDA included as well 	<ul style="list-style-type: none"> CQO: Classroom interaction scale, Adult Involvement Scale, PPVT-R, WJ-R, Classroom Behavior Inventory FL QIS: Classroom interaction scale, Adult Involvement Scale, children's activities, children's behavior (play scale, Revised Peer Play Scale) 	<ul style="list-style-type: none"> Teachers with higher degrees in ECE were more sensitive Teachers w/at least an AA were less harsh 	Observational, cross sectional, small sample; preschool age children	
Teacher characteristics and effective teaching in child care: Findings from the National Child Care Staffing Study	Howes, C., Whitebook, M., & Phillips, D.	1992	Child Care and Youth Forum	1,309	1,309 center-based child care staff - 865 teachers (805 teachers, 60 teachers-directors), 444 assistant teachers (286 assistant teachers, 158 aides)	National Child Care Staffing Study, February - August 1988	<ul style="list-style-type: none"> Level of formal education Level of specialized training 	<ul style="list-style-type: none"> Teacher behavior (ITERS/ECERS appropriate caregiving - sensitivity, harshness, detachment) 	<ul style="list-style-type: none"> Formal training strongest predictor of appropriate caregiving Formal education predicted teacher sensitivity, harshness, and detachment Having a bachelor's degree or college-level specialized training was associated with sensitive interactions For appropriate caregiving, teachers with a BA and ECE training or no BA and college ECE training showed the most appropriate caregiving (compared to BA, no ECE, lower levels of training) 	Observational, cross-sectional	

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Child care subsidy and quality	Jones-Branch, J. A., Torquati, J. C., Raikes, H., & Pope Edwards, C.	2004	Early Education and Development	34	34 classrooms (full-day, licensed, center programs; 19 subsidized, 15 unsubsidized)	Classroom observation and assessment, state service agreements, center director survey	<ul style="list-style-type: none"> Average hourly teacher salary Teacher education 	<ul style="list-style-type: none"> Classroom quality (ECERS-R) 	<ul style="list-style-type: none"> Full-time average salaries did not differ by group (subsidized vs. not) Full-time teacher salary was significantly correlated with teachers' highest level of education, and ECERS-R total scores No significant correlations for teacher education Full-time teacher salary accounted for nearly a quarter of the variance in total quality Subsidy density did not significantly predict quality after accounting for teacher salary 	Unclear controls used in regression models, very small sample, cross-sectional	
Classroom quality and children's academic skills in child care centers: Understanding the role of teacher qualifications	Lin, Y.-C., & Magnuson, K. A.	2018	Early Childhood Research Quarterly	189 teachers/661 children	189 lead teachers and classrooms, 661 children from 119 center-based programs	Centers selected from list of licensed centers participating in state QRIS (stratified by quality level, type of program - home or center, and region - mostly urban, mixed)	Teacher education, measured as: <ul style="list-style-type: none"> Attainment Categorical variable of # ECE related credits taken Attainment + # ECE courses Registry career level 	<ul style="list-style-type: none"> Global classroom quality (ECERS-R) Spring child school readiness scores (WJ-III Letter Word, WJ-III Applied Problems, Bracken) 	<ul style="list-style-type: none"> Teacher education and training associated with classroom quality Teacher education and training not associated with children's reading, math, and literacy skills 		Age group focus (pre-K only)
Child care in poor communities: Early learning effects of type, quality, and stability	Loeb, S., Fuller, B., Kagan, S. L., Carrol, B., & Carroll, J. (2003).	2004	Child Development	451	Families with TANF-eligible mothers with at least one resident child 12-42 months in San Francisco, San Jose, and Tampa.	Maternal interviews, child assessments, observations of center care and home-based care settings	<ul style="list-style-type: none"> Maternal and home characteristics Child care exposure Type Stability (quality, provider education) 	<ul style="list-style-type: none"> Total Bracken School-readiness FACES Mother-assessed cognition Social problems 	<ul style="list-style-type: none"> Evidence showed that provider education was significantly associated with bracken total and school readiness scores - providers with more education beyond high school showed improved social development Other outcomes include a correlation between cognitive growth and caregiver sensitivity/responsivity; and positive correlation between family child care homes and behavioral problems, but no relationship between family care homes and cognitive outcomes 	No comparison group, correlational, high attrition (77% participate in wave 2)	
Measures of classroom quality in prekindergarten and children's development of academic, language, and social skills	Mashburn, A. J., Pianta, R. C., Hamre, B. K., Downer, J. T., Barbarin, O. A., Bryant, D., Burchinal, M., Early, D., & Howes, C.	2008	Child Development	2,439	2,439 children in 671 pre-K classrooms in 11 states	National Center for Early Development and Learning's (NCELD) Multi-State Study of Pre-Kindergarten and the NCELD-NIEER State-Wide Early Education Programs Study (SWEEP Study).	Relevant child care quality measures: <ul style="list-style-type: none"> Teacher has BA+ Teacher has ECE/CD training Teacher's aide has CDA or BA Overall environment quality (ECERS-R) Quality of teacher-child interactions (CLASS emotional and instructional support) 	<ul style="list-style-type: none"> Academic and language skills (PPVT, OWLS, WJ-III sound awareness/rhyme, letter naming and applied problems subtests) Social skills (Teacher-Child Rating Scale, social competence, problem behaviors) 	<ul style="list-style-type: none"> Controlling for prior skill level, child and family characteristics, program characteristics, and state: the quality of teacher's instructional interactions predicted academic and language skills (PPVT, OWLS, rhyming, applied problems, letter naming), but not social skills The quality of teachers' emotional interactions predicted teacher-reported social skills (social competence, problem behaviors) Overall quality was linked only to OWLS (not any other outcome) In addition, the study did not find a statistically significant relationship between BA degree, ECE/CD training, or CDA degree and any academic and language outcomes Teacher has a BA degree was associated with social competence (positive, small beta), but not problem behaviors 	Observational, no comparison group	

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Quality improvements in the early care and education workforce: Outcomes and impact of the T.E.A.C.H. Early Childhood® Project	Miller, J. A., & Bogatova, T.	2013	Evaluation and Program Planning	203	Three cohorts of TEACH scholars between 1998 and 2003	Admin data from TEACH agency, site visit observations, questionnaires (work environment, professional activities, job satisfaction, teacher beliefs and instructional activities), ECERS-R, ITERS-R, Arnett's Caregiver Interaction scale	• TEACH scholarship program	• Turnover • Compensation • Educational attainment • Professional orientation • Job satisfaction • Belief/instructional activities • Child/caregiver interaction • Quality of care	• Positive outcomes for educational achievement, increased compensation, reduced turnover, and improved knowledge/skill/practice • Only 15% of scholars remained in the program through the 5th year	Major attrition issues, calls into question the analysis (only 15% left at end of sample)	
Characteristics of infant child care: Factors contributing to positive caregiving	NICHD ECCRN	1996	Early Childhood Research Quarterly		576 infants in nonmaternal care	NICHD SECC 10 sites throughout the country	• Formal education • Specialized training in ECE/CD • Caregiving experience • Caregiver beliefs	• Positive caregiving frequencies • Positive caregiving ratings (derived from subscales of the Observational Record of the Caregiving Environment) • HOME inventory • Assessment Profile for early Childhood Programs	• Formal education correlated to positive caregiver ratings (statistically significant) • No statistically significant correlations between specialized training and ratings or specialized trainings and formal education and frequencies • Caregiver formal education and specialized training did not significant add to the prediction of positive caregiving at 6 months	Observational, cross-sectional	
Characteristics and quality of child care for toddlers and preschoolers	National Institute of Child Health and Human Development (NICHD) Early Child Care Research Network	2000	Applied Developmental Science	Between 612 and 674 dependent on data collection period	612 children at 15 months, 630 at 24 months, 674 at 36 months of age, from 10 sites throughout the country	NICHD Study of Early Child Care 10 sites throughout the country (telephone interviews with mothers, child care observations)	• Formal education • Specialized training in ECE/CD • Caregiving experience • Caregiver beliefs	• Positive caregiving (Observational Record of the Caregiving Environment - frequency, ratings) • Global ratings of care ("common sense rating")	• Group size and ratios were more predictive of process quality for infants • Caregiver education and training were stronger predictors of quality for preschoolers • At 15 months, caregiver specialized training was associated with positive caregiver ratings, but not positive caregiving frequencies (education was not associated with either) • At 24 months, caregiver education was associated with positive caregiving ratings and frequencies (but specialized training was not associated with either) • At 36 months, caregiver education was associated with positive caregiver ratings, but not frequencies (specialized training was not associated with either) • Across ages and types of care, positive caregiving was more likely when child-adult ratios and group sizes were smaller, caregivers were more educated, held more child-centered beliefs about childrearing, and had more experience in child care, and environments were safer and more stimulating	Observations of outcomes are identified cross-sectionally	

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Child-care structure --> Process --> Outcome: Direct and indirect effects of child-care quality on young children's development	National Institute of Child Health and Human Development (NICHD) Early Child Care Research Network	2002	Psychological Science	813	Stratified random sample of women recruited through hospital visits who participated in the 1-month home visit, who were in 10 or more hours per week of observable child care for at least 6 months; model samples between 656-789 due to incomplete data	NICHD Study of Early Child Care 10 sites throughout the country (telephone interviews with mothers, child care observations)	<ul style="list-style-type: none"> Caregiving training (6-point scale from high school to PhD) Process quality (Observational Record of the Caregiving Environment) 	<ul style="list-style-type: none"> Process quality (Observational Record of the Caregiving Environment) Child cognitive competence (WJ, Preschool Language Scale) Child social competence (Child Behavior Checklist - internalizing and externalizing behavior problems) 	<ul style="list-style-type: none"> Significant positive direct effects were identified between training → nonmaternal caregiving and nonmaternal caregiving → cognitive competence Significant indirect effects were also seen between training → nonmaternal training → cognitive competence Caregiver report of social competence, same as for cognitive competence 	Observations of outcomes are identified cross-sectionally	
Within and beyond the classroom door: Assessing quality in child care centers	Phillips, D., Mekos, D., Scarr, S., McCartney, K., & Abbott-Shim, M.	2000	Early Childhood Research Quarterly	104 child care centers, 316 classrooms	104 nonsectarian licensed childcare centers from three sites; 98 infant classrooms (<=18 months), 112 toddler rooms (19-36 months), 106 preschool rooms (37-60 months); sample drawn from comprehensive list of licensed/registered centers in each state from November 1988-April 1989	Classroom observations and assessments, interviews with center directors and head teachers	Structural indicators of quality: <ul style="list-style-type: none"> Highest wage (highest hourly wage paid to a full-time teacher at the center) Teacher education (9-point scale for attainment) Teacher training (5-point scale from no specialized early childhood and development training to training in college/grad. school) 	<ul style="list-style-type: none"> Classroom environment quality (maximum likely factor analyses producing a single factor based on ITERS, ECERS, Assessment Profile for Early Childhood Programs, items standardized and averaged) 	<ul style="list-style-type: none"> Significant correlations between wages and teacher education and teacher training (toddler) were moderately strong and positive Correlations between wages and teacher training (infant) and wages and classroom quality were strong (both) Teacher education and training were both moderately correlated with classroom quality 	Observational and correlational. Cross-sectional. Limited controls. Small sample.	
The prediction of process quality from structural features of child care	Phillipsen, L. C., Burchinal, M. R., Howes, C., & Cryer, D.	1997	Early Childhood Research Quarterly	472	State licensing list, full-time centers -- 102 infant/toddler classrooms had complete data (of 228), 370 had complete data preschool classrooms (of 521); 2 children per classroom	Caregiver questionnaires, classroom observations, administrator interviews	<ul style="list-style-type: none"> Teacher education (BA, some college, HS diploma) Lead teacher hourly wage 	<ul style="list-style-type: none"> Process quality (ECERS/ITERS, Caregiver Interaction Scale, Teacher Involvement Scale) 	<ul style="list-style-type: none"> Infant/toddler classrooms ITERS scores significant associated with lead teacher's background, classroom structure, teaching staff wages, and economic characteristics of the center Preschool classrooms ECERS scores significant associated with all teacher background characteristics The authors specifically note the association of wages and quality outcomes as important (and not as a proxy for teacher background) 	Observational, cross sectional, small sample	

Child Care Workforce Qualifications											
Title	Author(s)	Year	Publication Source	Sample Size (N)	Sample Composition	Data Source	Independent Variable(s)	Dependent Variable(s)	Summary of Findings	Limitations to Causal Inference	Exclusion Criteria
Features of pre-kindergarten programs, classrooms, and teachers: Do they predict observed classroom quality and child-teacher interactions?	Pianta, R., Howes, C., Burchinal, M., Bryant, D., Clifford, R., Early, D., & Barbarin, O.	2005	Applied Developmental Science	238	238 classrooms in 6 states that had invested substantial resources in pre-k by 2001	National Center for Early Development and Learning's (NCEDL) Multi-State Study of Pre-Kindergarten	Teacher characteristics, including: <ul style="list-style-type: none"> • Education and training (categorical: no ECE training, less than a 4-year degree w/ECE training, 4-year degree + ECE training) • Hourly wages 	<ul style="list-style-type: none"> • Observed classroom quality (ECERS-R: teaching and interactions, provisions for learning; CLASS: emotional climate, instructional climate) • Teaching practices reflective of quality (Emerging Academics Snapshot: free choice/center activity, routine activity, whole group activity) 	<ul style="list-style-type: none"> • Wages correlated with ECERS-R provisions and Snapshot whole group and centers, but not other quality measures • No correlations between experience and any quality indicators • Quality significantly higher for some indicators of teacher credentialing when teachers had some level of specialized training in early childhood, but effects were small 	Observational, cross-sectional; small sample	
Child care quality in different state policy contexts	Rigby, E., Ryan, R. M., & Brooks-Gunn, J.	2007	Journal of Policy Analysis and Management	777	Parents and children in 14 cities who used child care at least 10 hours a week and were eligible for the Child Care Supplement in 2002 and 2003: 330 from Kith and Kin Care, 90 from Family Child Care, 125 from For-Profit Centers, 232 from Nonprofit Centers	Child Care Supplement data, Fragile Families and Child Wellbeing Study, in-home visit observations, caregiver interviews, child care setting observations, child care provider interview	<ul style="list-style-type: none"> • Subsidy receipt • Teacher training requirements • Teacher/child ratios 	<ul style="list-style-type: none"> • Quality of care • Use of center care 	<ul style="list-style-type: none"> • More stringent training requirements were associated with higher quality of nonprofit care 	Point in time correlation analysis	
Measurement of quality in child care centers	Scarr, S., Eisenberg, M., Deater-Deckard, K.	1994	Early Childhood Research Quarterly	363	363 child care center classrooms, in 120 centers, across 3 states; randomly selected from 3 classrooms within centers	Classroom observation and assessment, interviews with directors and head teachers	<ul style="list-style-type: none"> • Teacher educational attainment (9-pt scale no HS to PhD/EdD) • Teacher training in child development or child care (5-pt. scale 0 no training to 4 training in college or grad. school) • Highest hourly wage paid to staff, turnover 	<ul style="list-style-type: none"> • Process quality (ITERS, ECERS, Assessment Profile) 	<ul style="list-style-type: none"> • Modest to moderate correlations between process quality items and regulable quality items (education, ratios, wages, etc.). • Highest wage was most strongly correlated to process quality measures • Training and education were both moderately correlated with process quality measures 	Study design cross-sectional, observational, smaller sample size	
ECE quality indicators and child outcomes: Analyses of six large child care studies	Soliday Hong, S. L., Sabol, T. J., Burchinal, M. R., Tarullo, L., Zaslow, M., & Peisner-Feinberg, E. S.	2019	Early Childhood Research Quarterly	1,311 classrooms; 9,152 children	1,311 classrooms from two studies of HS (127 from FACES 2006 and 108 from FACES 2009), two state pre-K centers (96 from GA and 158 from NC), and two studies of preschool classrooms (683 from ECLS-B and 139 from NCRECE);	ECLS-B, NCRECE, FACES 2006, FACES 2009, GA Pre-K, NC PRE-K	<ul style="list-style-type: none"> • ECE quality measures: • Teacher education • Child/adult ratio • Curriculum • Director education • Group size • ECERS • Class 	<ul style="list-style-type: none"> • Preschool child outcomes (early literacy, language, math, social-emotional adjustment) 	<ul style="list-style-type: none"> • Teacher education significantly associated with pre-literacy (categorical), language, pre-literacy, and math (continuous) • Negative null in both for social skills 		Age group focus (pre-K only)

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Title	Author(s)	Year	Publication Source	Sample Size (N)	Sample Composition	Data Source	Independent Variable(s)	Dependent Variable(s)	Summary of Findings	Limitations to Causal Inference	Exclusion Criteria
Teacher education, motivation, compensation, workplace support, and links to quality of center-based child care and teachers' intention to stay in the early childhood profession	Torquati, J. C.; Raikes, H.; & Huddleston-Casas, C.	2007	Early Childhood Research Quarterly	964 survey responses; 223 classroom observations	Stratified random sample of state-level child care licensing and subsidy files April - August 2001; 964 child care center providers (full-day, full-year programs); 223 of these providers participated in classroom observation (122 infant/toddler, 105 preschool)	Telephone surveys, classroom observations and assessments collected April - August 2001	<ul style="list-style-type: none"> Teacher education (years, CDA, certificate, focus on child development) Teacher compensation (annual wages, benefits - yes/no, type) 	<ul style="list-style-type: none"> Intention to stay in ECE field (years more, would choose career if choosing today) Observed program quality (ITERS, ECERS-R) Interactional quality (Arnett Caregiver Interaction Scale) 	<p>Models for infant/toddler teachers only:</p> <ul style="list-style-type: none"> Education years, child development training predicted compensation in the observational quality models Motivation predicted intention to stay in observational and intentional quality models. Workplace supports were not important predictors in the model 	Observational, correlational, cross-sectional; No comparison group	
Retaining early childhood education workers: A review of the empirical literature	Totenhagen, C. J., Hawkins, S. A., Casper, D. M., Bosch, L. A., Hawkey, K. R., & Borden, L. M.	2016	Journal of Research in Childhood Education	32 articles	Studies that used quantitative or qualitative empirical information, focused on experiences of child care workers in child care centers, and were from the United States	Studies of predictors of retention	<ul style="list-style-type: none"> Wages and benefits Job satisfaction Alternative employment opportunities Education and training Demographic characteristics Organizational characteristics Job characteristics 	<ul style="list-style-type: none"> Retention 	<ul style="list-style-type: none"> In general, research suggests that low wages are associated with retention intentions and turnover, as well as job satisfaction and organizational commitment Evidence is mixed on association between education level and retention within specific jobs or child care centers 	Literature review only	
Lessons from CARES and other early care and education workforce initiatives in California, 1999–2004	Whitebook, M., & Bellm, D.	2004	Institute of Industrial Relations, Center for the Study of Child Care Employment	4 evaluations	4 CARES/CRI programs; 5,060 center-based staff, 736 family child care providers (CARES/CRI program participants)	Implementation evaluations, outcome evaluations of CARES/CRI programs	<ul style="list-style-type: none"> Program participation 	<ul style="list-style-type: none"> Staff retention Educational/ training attainment 	<ul style="list-style-type: none"> Participation associated with stronger involvement in professional development Participants generally exceeded education and training program requirements 	Summary of other evaluations; study design limitations in studies	
Turnover begets turnover: an examination of job and occupational instability among child care center staff	Whitebook, M., & Sakai, L.	2003	Early Childhood Research Quarterly	220	149 child care center teaching staff and 71 directors, 1996-2000, sample of centers drawn from larger study examining NAEYC accreditation and link to quality improvement	Interviews with directors and teaching staff (adapted from National Child Care Staffing Study)	<ul style="list-style-type: none"> Teacher education Specialized training Hourly wages Low vs. high-background (BA + early childhood training) 	<ul style="list-style-type: none"> Job turnover Occupational turnover 	<ul style="list-style-type: none"> 46% of teachers stayed at same center, 54% were no longer in the same center, but among those, half were still in the ECE field No significant differences between leavers and stayers on education and specialized training Teachers who stayed at their jobs were more likely to be paid higher in 1996 and receive pensions in 2000 (not significant in 1996) vs. leavers No significant differences between directors who stayed and left on items of interest 	Observational, correlational; no real comparison group	

Child Care Workforce Qualifications

Title	Author(s)	Year	Publication Source	Sample Size (N)	Sample Composition	Data Source	Independent Variable(s)	Dependent Variable(s)	Summary of Findings	Limitations to Causal Inference	Exclusion Criteria
Who cares? Child care teachers and the quality of care in America. (Final Report, National Child Care Staffing Study)	Whitebook, M., Howes, C., & Phillips, D.	1989	Center for the Study of Child Care Employment	254 children, 1,309 teachers	CENTERS: 227 licensed child care centers; 643 classrooms (85 infant, 151 toddler, 323 preschool, 94 mixed-age); TEACHERS: 1,309 teaching staff (805 teachers, 60 teacher-directors, 286 assistant teachers, 158 aides); CHILDREN: 254 total (91 infants, 57 toddlers, 106 preschoolers, Atlanta only)	National Child Care Staffing Study	<ul style="list-style-type: none"> Teacher formal education Specialized training (early childhood education) Teacher union and professional association membership Child care experience Adult work environment Center type (quality standards, NAEYC members, non-profit status) 	<ul style="list-style-type: none"> Teacher job satisfaction Teacher turnover Quality of care (ECERS preschool, ITERS - infant/toddlers) Quality factors: teacher-child interaction and classroom's child development environment Child development environment Teacher-child interaction Child development 	<ul style="list-style-type: none"> There was a significant difference between teachers with a bachelor's degree and those with lower levels of attainment Child care experience not a good predictor of teacher/child interaction Specialized training mattered more for predicting positive child/teacher interaction in infant/toddler classrooms than pre-school classrooms Observed quality of adult needs was associated with multiple, significant measures of job satisfaction Teachers in classrooms with better ratios and high developmentally appropriate activity were more sensitive, less detached, less harsh Link between teacher behavior and child development - high turnover associated with poor indicators of development 	Minimal and unclear controls, study design observational and correlational. Smaller sample.	