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Literature review on early
childhood education
and care for children under
the age of 3

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DIRECTORATE FOR EDUCATION AND SKILLS

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Abstract

This literature review provides an up-to-date comprehensive overview of what is known about process quality in early childhood education and care (ECEC) provision for children under age 3. It builds on empirical studies published in peer-reviewed journals between 2010 and 2019. Current views on process quality for children under age 3 highlight that process quality is a multidimensional and value-laden concept. But there is growing agreement on several core features, namely, the prominence of warm/responsive interactions, the value of both education and care and the importance of strong partnerships with parents. Recent studies show positive links between process quality and infant/toddler development. The evidence is relatively robust in terms of the influences of staff pre-service training, group size and ratios for process quality in centre-based settings, although more limited for home-based settings. Nevertheless, consideration of complex interactions among structural features is noted. Recent studies further advance knowledge on more fine-grained understandings of process quality.

Résumé

Le présent examen de la littérature donne une vue d'ensemble des connaissances actuelles sur la qualité des processus dans l'éducation et l'accueil des jeunes enfants (EAJE) chez les moins de 3 ans. Il s'appuie sur des études empiriques publiées entre 2010 et 2019 dans des revues pratiquant l'examen collégial. Les points de vue actuels sur la qualité des processus pour les moins de 3 ans montrent que ce concept est multidimensionnel et chargé de valeurs. On s'accorde toutefois de plus en plus sur plusieurs aspects fondamentaux, à savoir le rôle majeur de l'écoute et des interactions chaleureuses, la valeur à la fois de l'éducation et de l'accueil et l'importance de partenariats solides avec les parents. Des études récentes montrent des corrélations positives entre la qualité des processus et le développement des bébés et des tout-petits. Les données sont relativement solides en ce qui concerne l'influence de la formation initiale du personnel, de la taille du groupe et du taux d'encadrement sur la qualité des processus dans les structures en établissement, quoique plus limitées pour les structures à domicile. Les interactions complexes entre diverses caractéristiques structurelles sont néanmoins prises en considération. De récentes études plus approfondies permettent de comprendre de façon plus fine la qualité des processus.

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Introduction

This document provides a literature review on early childhood education and care for children under the age of 3. The main aim of the review is to provide a comprehensive overview of what is known about quality of early childhood education and care (ECEC) provision for children aged 0 to 3, in order to support and complement the analysis and interpretation of the data to be included in the OECD Starting Strong Teaching and Learning International Survey (TALIS Starting Strong) thematic report. It builds on a broad scope of literature, including both quantitative and qualitative empirical studies, published in peer-reviewed journal articles or research reports between 2010 and 2019.

As indicated by several OECD reports (OECD, 2018^[1]; OECD, 2019^[2]; OECD, 2019^[3]), provision for children under 3 years has increased over the last years. In addition, OECD countries have increasingly been paying more attention to the quality of education and care. Nevertheless, research focusing on quality provision for children under age 3 in general, and literature reviews in particular, are lacking. Furthermore, research has also highlighted the dynamic nature of ECEC, as a result of economic development and rapid social change, as well as changes on child-rearing patterns over time (Eckhardt and Egert, 2018^[4]). It is thus also the goal of this literature review to document the most up-to-date evidence, as well as to contribute to current discussions on quality issues in ECEC for children under age 3.

ECEC quality is a multidimensional concept involving distal and regulable factors, stable characteristics of the ECEC environment, cultural values and beliefs, and dynamic features related to children's daily experiences in the ECEC context. It has been increasingly acknowledged that, among the several dimensions of ECEC quality, the most relevant quality dimension is process quality, which entails children's everyday interactions with staff¹ and peers and their engagement in play, activities and routines (OECD, 2018^[1]). Therefore, the current literature review particularly focuses on process quality for infants and toddlers, providing insights based on scientific evidence and theoretical discussions on process quality and underlying concepts.

To ensure high-process quality, structural and policy levers and constraints that are at different system levels need to be considered, including features from the macrosocial governance level, regulations on staff qualifications, working conditions and in-service training, as well as features at the micro-level, such as group sizes or child-adult ratios. Consequently, the literature review covers studies examining such features, considering the specific quality and policy issues of ECEC provision for children under the age of three.

The delivery of ECEC services for children under the age of 3 involves, in many countries, diverse types of provision, often including regulated home-based ECEC (Ang and Tabu, 2018^[5]). Thus, in the current literature review, studies on regulated home-based and centre-based provision of ECEC for children under age 3 are included and contrasted.

¹ Throughout the paper, the authors respect the terminology used by each particular study (e.g., staff, educators, teachers, caregivers, practitioners), as the specific term may be important for the study and be more appropriate for that particular context.

The literature review is organised along five chapters. Chapter 1 provides an overview of current conceptual frameworks on process quality for this age group, with an emphasis on the particularities of ECEC services for children under age 3. It also covers recent studies on process quality, including the latest evidence on its associations with child development, learning and well-being.

Chapter 2 focuses on multi-level system features that constrain or lever process quality, highlighting aspects that are specific to the provision of ECEC for children under the age of 3. It includes pressing issues related to the current challenges and state of the art, namely the trend towards more integrated systems worldwide (OECD, 2019^[2]), and equity concerns in access and participation, which remain a challenge for several OECD countries.

Chapter 3 addresses staff's pre-service training, licensing, professional development, working conditions and their links with process quality. ECEC staff are at the core of the quality of ECEC, they profoundly shape children's learning, development and well-being through their everyday interactions.

Chapter 4 focuses on the structural characteristics of settings and groups, namely group size (i.e. the number of children within a classroom or playgroup) and adult-child ratios, as well as less studied features such as child group composition.

Finally, chapter 5 contributes to a more nuanced understanding of the concept of process quality, by examining how its scope has been broadened to include variations across educators or within and across the days, and discussing previously overlooked aspects such as peer interactions.

Box 1. Eligibility criteria and search strategy for studies included in the literature review

The aim of this literature review is to summarise the most recent literature about process quality for children under 3 years, in both centre-based and home-based settings.

First, a set of criteria were defined for the inclusion of studies in the present review, coherent with its main objective. Specifically, studies had to (i) focus on early childhood education and care (ECEC) for children under 3 years (centre and/or home based) and its relation to process quality, and to (ii) be recent (i.e. from 2010 onwards). Studies were excluded if the sample consisted exclusively of classrooms/playgroups serving older children (from preschool onwards), or other caregivers (e.g. parents). For the search, standard systematic review procedures were followed, namely by running searches in the scientific databases — Clarivate Analytics' Web of Science and several EBSCO's databases — according to a predefined search strategy (in Annex A). After the search process, an initial abstract screening was conducted to exclude studies that did not meet the inclusion criteria.

Studies that passed the initial screening procedure were carefully reviewed for its objective(s), participants, measures, findings and conclusions. The final decision about inclusion was made considering the quality and robustness of the findings, but also the relevance of the study for the main objectives of the present review. The study design could be correlational, quasi-experimental, experimental, systematic review or meta-analysis. Studies had to explicitly address process quality and incorporate it in their findings. This meant that empirical studies about ECEC that did not include any assessment of process quality were not considered.

Great attention was dedicated to the methodology used in each study, in particular the degree of reliability with which the results were presented, focusing on the kind of measure of process quality, which in most studies (but not all) corresponded to international validated rating scales. For theoretical, descriptive, or qualitative studies, decision on their inclusion was based on whether they either: (a) provided a sustained theoretical framework of process quality and related constructs, contributing to the discussion of the concept; b) included a description of the context, system of ECEC for under 3s in understudied countries; c) reported on educators' perspectives, helping to better understand the cultural relevance of concepts, practices and, in particular, of professional development initiatives.

A note on the measures commonly used measures to assess ECEC process quality

Across studies, the most commonly used measures were Infant/Toddler Environment Rating Scale, Revised (ITERS-R)/ Family Child Care Environment Rating Scale, Revised (FCCERS-R); Classroom Assessment Scoring System (CLASS) and Arnett Caregiver Interaction Scale (Arnett CIS). The three measures are observational and follow standard procedures conducted by trained observers. All of these measures have been widely used and adapted in many different countries.

The ITERS-R and FCCERS-R (Harms, Cryer and Clifford, 2007^[6]; Harms, Cryer and Clifford, 2003^[7]) encompasses a broad range of quality indicators to assess the extent to which (i) adults develop stimulating and sensitive interactions with children, (ii) children interact with a variety of age-appropriate materials and activities, and (iii) the child's health and safety is secured in the observed environment.

The Caregiver Interaction Scale (CIS; (Arnett, 1989^[8])). The CIS focuses on educators' emotional tone, discipline style, and sensitivity to children.

The CLASS-Toddler (LaParo, Hamre and Pianta, 2011^[9]) focuses on the quality of interactions among educators and toddlers and include aspects such as emotional and behavioural support (e.g. Positive climate, Teacher sensitivity) and engaged support for learning (e.g. Facilitation of learning and development, Language modelling).

1. Process quality

1.1. Conceptual framework and overview

It is well documented that process quality is, among several dimensions of ECEC quality, the primary driver of children's development, learning and well-being (OECD, 2018^[1]). Process quality comprises children's daily experiences in the classroom/playgroup, covering the dynamic features of children's interactions with materials, peers and educators. These experiences are believed to provide a foundation for young children's development and well-being (Jamison et al., 2014^[10]; Sroufe, Coffino and Carlson, 2010^[11]). Even though the concept of high-quality practices is not univocal and is ultimately linked to particular cultural values, a broad range of contemporary theoretical and cross-disciplinary approaches, including neurobiological science, early childhood pedagogy, and developmental psychology has brought into light a set of key principles underlying high-quality ECEC practices for children under age 3 (Dalli and White, 2017^[12]). There is increased convergence on the relevance of considering four interrelated aspects while approaching process quality for infants and toddlers: (i) the crucial role of reciprocal and responsive relationships, (ii) the strong (and desirable) links between care and education and (iii) the specific developmental needs of infants, and (iv) the supremacy of collaborative relationships with the family.

The power of relationship-based practices

Central to process quality, and particularly for children under age 3, are the relationships caregivers and teachers develop with children. Ideally these relationships are warm, meaningful, sensitive and stimulating (Bjørnstad and Os, 2018^[13]; Hamre et al., 2014^[14]; Pinto et al., 2019^[15]). Infants and toddlers rely greatly on caregivers to engage with the environment around them and to manage their interactions (Hamre et al., 2014^[14]; Jamison et al., 2014^[10]). Thus, relationship-based practices involving sensitive and responsive caregivers are likely the most critical dimension of process quality for very young children (Cople and Bredekamp, 2009^[16]; Katsiada et al., 2018^[17]; Layland and Smith, 2015^[18]; Layland and Smith, 2015^[18]). In addition, it is widely accepted that, in order to bring maximal developmental benefit, child–adult interactions must be continually sustained and become increasingly complex over time (Bronfenbrenner and Morris, 2006^[19]). Therefore, rich play opportunities, together with reciprocal and scaffolding interactions, encourage infant and toddlers' exploration and learning (Ruzek et al., 2014^[20]).

From an attachment theory perspective, close, warm, and responsive relationships provide the basis to develop a secure base from which infants and toddlers explore their environment and develop a sense of independence or autonomy (Ereky-Stevens et al., 2018^[21]; Hamre et al., 2014^[14]; Jamison et al., 2014^[10]). Within this framework, young children in ECEC are seen to develop attachment relationships to their educators, with robust evidence showing that meaningful relationships with educators help children be socially competent, exhibit higher levels of play, and be more independent (Hamre et al., 2014^[14]; Jamison et al., 2014^[10]). The importance of relationship-building processes for child development and well-being is therefore widely accepted across the ECEC field.

Linking care and education

Infants and toddlers can spend a significant amount of time in routine care, such as diaper changing, napping or meals. As several interactions between the child and educators take

place in care situations, it has been increasingly highlighted that educators can be intentional on the use of such one-to-one moments to interact, communicate, and build relationships with each infants and toddlers (Zero To Three, 2010^[22]). Several authors have used the term *educare* to describe an approach in which both education and care are highly valued and viewed as inseparable (Arenhart, Guimarães and Santos, 2018^[23]; Bussey and Hill, 2017^[24]; Kaga, Bennett and Moss, 2010^[25]; Sims et al., 2018^[26]). Overall, recent perspectives call for an integrated approach of care and education (Rutanen and Hännikäinen, 2017^[27]; Arenhart, Guimarães and Santos, 2018^[23]; Bussey and Hill, 2017^[24]). Therefore, moments in care such as meals or dressing are seen as valuable for engaging with infants and toddlers. Care moments are privileged opportunities for adults to get involved in one-to-one interactions, devote time and attention to individual children, and develop respectful, reciprocal, and responsive interactions (Arenhart, Guimarães and Santos, 2018^[23]; Bussey and Hill, 2017^[24]). Although care is often understood as physical caregiving in daily routine situations, it has been argued that care can and should also be conceived as ‘caring’, that is, the emotional investment from educators to genuinely listen, appreciate and understand the child (Rutanen and Hännikäinen, 2017^[27]). This additional understanding gives greater emphasis to the importance of care in the interactions with the young children and links to the crucial role of sensitive and responsive relationships in ECEC provision.

However, several scholars have highlighted the barriers that limit staff acknowledgment of care moments as rich learning ones (Arenhart, Guimarães and Santos, 2018^[23]; Bussey and Hill, 2017^[24]). For instance, although some of the care moments seem to be valued by educators (Arenhart, Guimarães and Santos, 2018^[23]; Bussey and Hill, 2017^[24]), limitations such as time available for care routines or division of tasks may prevent educators from being more involved in care moments, leading to less valorisation of care as an educational moment (Arenhart, Guimarães and Santos, 2018^[23]; Swindle et al., 2018^[28]). For instance, in one study conducted in Brazil, assistants rather than educators were mainly responsible for conducting the care routines, such as bathing the baby. Even though assistants can be active and powerful educators, such division of tasks may lead educators to not get involved in care moments, which can contribute to a greater separation of care and education (Arenhart, Guimarães and Santos, 2018^[23]). Other studies have highlighted the multiple challenges that educators face in their daily work (Rutanen and Hännikäinen, 2017^[27]), namely how decisions need to be taken continuously in situations where several children’s needs compete for attention. This suggests that educator day-to-day practices are highly complex and highlights the many challenges educators continuously face.

The specific developmental needs of infants

Because infants rely almost exclusively on their caregivers to meet their most basic needs, decades of research document that caregivers must be responsive and sensitive to children’s needs and interests for infants to thrive (Pinto et al., 2019^[15]). For young infants, non-verbal interactions are particularly important and as such, responsiveness to children’s non-verbal cues, as well as communicating using language they can understand, have been emphasised as key quality dimensions (Pauker et al., 2018^[29]). A strong, responsive relationship is important to support the interpretation of children’s signals and facilitate their communication (Brebner et al., 2015^[30]). A responsive relationship may help educators to contextualise children’s behaviour according to their personality and life, helping them to interpret cues and thus further supporting appropriate responses to them (Brebner et al., 2015^[30]).

There is now robust evidence showing that infants can communicate their intentions and feelings from a very early age (Trevarthen and Delafield-Butt, 2017^[31]). In addition, infants

are prone to share their interest in objects and events with persons, which emphasises children's interest in the social world (Trevvarthen and Delafield-Butt, 2017^[31]). Many different theoretical approaches have led to an acceptance that infants approach the world with feelings of curiosity and enjoyment and that infant's learning is, by nature, affective and purposeful [see (Trevvarthen and Delafield-Butt, 2017^[31]) for an overview]. Sensitive interactions, through which educators show awareness of the infant's ability, willingness, and capacity for interaction and provide physical and verbal support to infants, are of paramount importance (Jamison et al., 2014^[10]; Hamre et al., 2014^[14]).

Some authors have also contended that, given the holistic nature of infants' life experiences, planning meaningful experiences requires flexibility and contextualised decision-making, based on careful observations of infants' development status, interests, and changing needs (Shin and Partyka, 2017^[32]). Scholars have emphasised that the balance between respecting the infant's choices or stimulating new experiences is not easy, requiring from the educators complex planning processes through thoughtful and continuous decisions as they engage with the children (Shin and Partyka, 2017^[32]). As stated by Sumsion et al. (2018^[33]), the relationship between curriculum guidelines and day-to-day pedagogical practices should be thought as a dynamic interplay, through which educators adjust their practice according to the time, place and context of learning. There is some empirical work examining play (Shin and Partyka, 2017^[32]), shared book reading (Torr, 2019^[34]) and routines (Brebner et al., 2015^[30]), suggesting that while a multitude of activities can and should be planned and conducted with infants, this can be challenging for educators. In fact, as infants' interests and needs change rapidly, it is required from the educator sensitivity combined with a professional understanding of early development, learning, and education so that planning and decisions are informed and open to unique experiences (Zhang and Chan, 2019^[35]).

Some scholars (Loizou and Recchia, 2018^[36]) note that although infant education and care demands specific knowledge of infant development to better support their attempts to explore and communicate, teacher training is usually more focused on older children. In addition, teacher training commonly focuses on operational aspects such as preparing materials and planning activities, rather than on relationships or scaffolding (Barros et al., 2018^[37]; Chazan-Cohen et al., 2017^[38]; Gibbons, Stratford and White, 2017^[39]). The issue of specialist age-based qualifications is also subject to debates and tensions, with some authors arguing that the normalisation of a child's development into ages can limit the ways in which the whole child is understood, as well as claiming that such specialisation can amplify a narrow view of educators' practices (Sumsion, Harrison and Bradley, 2018^[33]). Overall, scholars agree that infant practitioners are required to have an in-depth professional knowledge on infant development and well-being (Barros et al., 2018^[37]; Chazan-Cohen et al., 2017^[38]; Gibbons, Stratford and White, 2017^[39]).

Partnerships between staff and parents/guardians

Strong partnerships between parents and ECEC staff have been shown to promote children's social and cognitive development and to facilitate the transition from home to ECEC for all children (Coelho et al., 2019^[40]; McBride, Bae and Wright, 2002^[41]; Owen et al., 2008^[42]; Pirchio, Taeschner and Volpe, 2011^[43]). Although strong parent-teacher partnerships and communication are important for children in the full 0-6 years range, they are particularly relevant for children under age 3. Research underlines that close partnerships allow parents and educators to share information about the child, promoting continuity between home and early childhood education, parents' confidence in their childcare arrangement, as well as the quality of care in both settings (Coelho et al., 2019^[40]; Leavitt, 1995^[44]; Owen et al., 2008^[42]; Layland and Smith, 2015^[18]). Also, parents seem to

value long-lasting partnerships (Swartz and Easterbrooks, 2014^[45]) and communication with educators in ECEC (Bossi, Brites and Piccinini, 2017^[46]; Baumgartner et al., 2017^[47]; Rentzou, 2013^[48]), further emphasising the importance of educators' behaviours, such as being affectionate and receptive, as facilitators of the adjustment of young children to ECEC settings. The quality of the relationships that teachers develop with children is co-dependent of the relationships teachers and parents develop, further highlighting the importance of open and trusting relationships between them (Layland and Smith, 2015^[18]).

Parent-teacher relationships are currently seen as multifaceted, incorporating features such as communication, comfort and encouragement, as well as levels of agreement in childrearing beliefs and/or practices (Lang et al., 2016^[49]; Lang, Schoppe-Sullivan and Jeon, 2017^[50]; Maras, Lang and Schoppe-Sullivan, 2018^[51]). Recent attempts to understand family-teacher partnerships in daily exchanges have emphasised the importance of good and open communication between parents and educators, enjoyment of the overall connection, but also potential challenges, such as disagreements on practices such as feeding or toilet training (Lang, Schoppe-Sullivan and Jeon, 2017^[50]; Maras, Lang and Schoppe-Sullivan, 2018^[51]).

Several features have been found to influence the quality of the relationship between parents and educators, namely, the frequency of parent-educator contacts, educators' experience and the presence of teamwork (Cantin et al., 2012^[52]), educators' knowledge of child development (Swartz and Easterbrooks, 2014^[45]), as well as parents' perceived support, the educational value parents attributed to the day-care experience (Pirchio, Taeschner and Volpe, 2011^[43]) and parents' anxiety about placing their children in care (Swartz and Easterbrooks, 2014^[45]).

Recent studies have also shown that partnerships between ECEC centres and other institutions from the health and social sectors have the potential to offer children and families comprehensive services, such as health, developmental, nutritional, and behavioural screenings, parenting classes, and linkages to economic supports (Halle et al., 2019^[53]; Levere et al., 2019^[54]). Such partnerships can ensure all children and families access to comprehensive health or social supports and thus expand the access to high-quality early care and education.

1.2. Links between process quality and child development and well-being

Overall, high-quality centre-based ECEC is associated with better development for children under age 3

It is well documented that process quality is associated with better child development and well-being for children under age 3, yielding stronger links than structural quality (OECD, 2018^[1]; Sylva et al., 2011^[55]). In addition, longitudinal studies examining the effects of ECEC quality (birth to 4 years) have shown long term benefits of high quality over extended periods of time (Vandell et al., 2010^[56]). Recently, a few studies with robust methodology further document positive effects of high process quality for child development and engagement levels (Choi et al., 2019^[57]; Kwon et al., 2019^[58]; Pinto et al., 2019^[15]).

A study with infants and toddlers developed in Peru, involving 2 198 children in 582 playgroups, found positive associations between higher-quality interactions and communication, problem-solving, and fine motor skills, with positive effects being particularly important for children with lower development scores (Araujo, Dormal and Schady, 2019^[59]). Process quality in infant playgroups was also analysed in a study in Portugal, showing positive associations between higher-quality interactions and infants'

engagement and adaptive behaviour, assessed six months later (Pinto et al., 2019^[15]). Similarly, in the United States, infant-toddler process quality was related to higher levels of children’s receptive vocabulary and lower levels of behavioural concerns in preschool (Horm et al., 2018^[60]). Findings from a study in United States also found an association between one dimension of process quality, teacher sensitivity, and growth in toddlers’ emotion regulation (Mortensen and Barnett, 2018^[61]). In the United Kingdom, a recent study reported that centre-based quality for children up to 36 months had positive long-lasting effects on children’s verbal cognitive development at age 5 (Barnes and Melhuish, 2017^[62]). However, the effects were found to be marginal. In fact, even though most studies point to positive links between process quality and child development, other studies did not find such links (Aguiar and McWilliam, 2013^[63]; Cote et al., 2013^[64]; Eliassen, Zachrisson and Melhuish, 2018^[65]; Stein et al., 2013^[66]). For instance, in one study in Norway, global process quality was not associated with children’s cognitive development at age 3 (Eliassen, Zachrisson and Melhuish, 2018^[65]). In another study, the quality of care was found not to be associated with time spent in sophisticated engagement, although toddlers who attended higher-quality ECEC classrooms/playgroups spent significantly less time non-engaged than toddlers in classrooms/playgroups of lower quality (Aguiar and McWilliam, 2013^[63]). It is possible to speculate that quality effects appear later on in children’s development and/or that these results originated from poorly calibrated outcome measures, but more empirical evidence is needed.

Associations between high-quality home-based ECEC and toddlers’ development have been also reported

Positive associations between high-quality home-based care and child socioemotional, cognitive and language development — albeit supported by fewer research — have also been found. Specifically, findings suggest that the quality of the home-based settings [measured using the Arnett Caregiver Interaction Scale (Arnett CIS)] is associated with toddlers’ socio-emotional outcomes (Colwell et al., 2013^[67]), as well as cognitive and language competence (Lahti et al., 2015^[68]). Additionally, other studies, which report results for both centre-based and home-based care combined [measured by the Infant/Toddler Environment Rating Scale (ITERS) and Family Child Care Environment Rating Scale (FCCRS)], have also shown high-quality processes to be beneficial for children’s cognitive scores (Ruzek et al., 2014^[20]; Votruba-Drzal et al., 2013^[69]).

[Links between process quality and child development may be associated with other features](#)

Research conducted in the United States has examined specifically whether high process quality may be more important for children from lower income or less educated, family contexts, but the findings are mixed (Ruzek et al., 2014^[20]; Votruba-Drzal et al., 2013^[69]). A nationally representative, longitudinal cohort study found no evidence that poverty (i.e. low income) influenced the quality effects for children at two years of age (Ruzek et al., 2014^[20]). Another study, also using a large data set from the United States, found a moderating effect between process quality and poverty on child outcomes, suggesting that high-quality ECEC can help to diminish the cognitive skills gap between toddlers from more and less advantaged family (Votruba-Drzal et al., 2013^[69]).

Other studies have also shed light on the importance of exploring the relations between characteristics at the individual level and process quality. For example, Philips et al. (2012^[70]) reported that quality of ECEC was more important for children with more reactive temperaments. In detail, when compared to moderately reactive children, highly positively and negatively reactive temperaments presented better levels of social integration when ECEC quality was higher (Phillips et al., 2012^[70]). Another study has

yielded moderation effects of gender and temperament between ECEC quality and externalising and internalising behaviours (Lemay, Bigras and Bouchard, 2014^[71]). While there were not differences of externalising behaviours based on the quality of care for boys, for girls' lower levels of interaction quality related to higher rates of externalising behaviours and higher levels with lower rates of externalising behaviours. Additionally, child temperament and ECEC quality individually predicted internalising behaviours. Gender, as affective self-regulation, were also found to moderate the relation between process quality and toddlers' social competence, in a study by Broekhuizen and colleagues (2015), where the relation seemed particularly significant for boys and toddlers with lower affective self-regulation skills (Broekhuizen et al., 2015^[72]).

2. Governance and regulations

This chapter discusses how governance and regulations can constrain or lever process quality in ECEC for children under age 3 focusing on three pressing issues related to the current challenges and state of the art. As there seems to be a trend towards more integrated systems worldwide decade (European Commission/EACEA/Eurydice, 2019^[73]; OECD, 2019^[3]), for the first issue we specifically focus on recent evidence about the benefits and risks of an integrated ECEC approach to the services for children between 0 to 6 years old. Second, we address equity concerns in access and participation, which remain a challenge for several OECD countries (OECD, 2019^[3]). Finally, this chapter also reviews the literature regarding home-based care given the importance of this form of care in the current ECEC provision for children under age 3 — and the fact that it has been, relatively to centre-based, understudied.

2.1. Integrating ECEC systems, policies and regulations for better quality

In many countries, there has been an increasing focus on providing high-quality education and care for children under the age of 3, resulting in an increase on participation rates over the past decade (European Commission/EACEA/Eurydice, 2019^[73]; OECD, 2019^[3]). Nevertheless, there are still many differences in enrolment rates, as well as the required staff qualifications or curriculum guidelines, between pre-primary centres and centres serving children under age of 3. In fact, across OECD countries and economies, public funding for centres serving children under the age of 3 is lower compared to pre-primary education centres in many countries (OECD, 2019^[3]). This difference in funding may have implications for the legal entitlements, the intensity of participation and the overall enrolment rates, particularly for children from disadvantaged socio-economic backgrounds.

Part of the reason for such discrepancies is related to the historical division between what is generally designated as childcare (0-3) and pre-primary education (3-6) learning (Kaga, Bennett and Moss, 2010^[25]; European Commission, 2013^[74]). However, the rise of policy attention to the education/developmental support and care provided for children under the age of 3 is leading many countries to a progressive change towards more integrated systems (European Commission/EACEA/Eurydice, 2019^[73]; OECD, 2019^[3]). The traditional existence of split systems is currently blurring, with an increasing number of countries integrating 0-6 ECEC policies and regulations (European Commission/EACEA/Eurydice, 2019^[73]). In 2019, the OECD estimated that about half of the OECD countries have a somewhat integrated ECEC system (OECD, 2019^[3])

Integrated ECE services may be characterised by coherent governance under one lead authority, by services provided in a single setting until the start of primary education, and/or by a common curriculum covering the entire ECE (European Commission/EACEA/Eurydice, 2019^[73]; OECD, 2019^[3]). It has been suggested that integration involves multiple dimensions and levels, with countries varying significantly on the levels of integration. Therefore, integration can be better understood as a continuum, rather than as a binary option between split versus integrated ECEC (European Commission/EACEA/Eurydice, 2019^[73]; OECD, 2019^[3]; Kaga, Bennett and Moss, 2010^[25]).

Several advantages of an integrated ECEC system have been highlighted (Kaga, Bennett and Moss, 2010^[25]). Overall, integrated services can support greater continuity for children,

parents and staff in key areas such as access, regulation, funding, and staffing regimes. Integrated systems can promote greater quality and consistency across sectors, as well as a generally more coherent policy (Kaga, Bennett and Moss, 2010^[25]). The potential gains might be observed in terms of social objectives, curriculum and assessment, costs to parents, and opening hours.

Additionally, integrated approaches may facilitate greater and more effective investment in the youngest children, through an increased awareness and focus on children under age 3, thus helping to reduce inequalities between the services for children under and over 3 years. Additionally, the development of articulated curricula for children under and over 3 years can contribute to higher specialisation of the workforce, which in its turn might result in a higher appraisal of the ECEC staff and recognition of the pedagogical value of ECEC (Kaga, Bennett and Moss, 2010^[25]).

However, in some countries, the integration of ECEC can also bring some risks and challenges. One main identified risk is what has been called the ‘schoolification’ of ECEC services, i.e. “the downward pressure of primary school approaches (classroom organisation, curriculum, teaching methods, child-to-staff ratios and conceptions of childhood) on early childhood pedagogy” (Kaga, Bennett and Moss, 2010, p. 9^[25]). Predefining standards regarding learning goals for the youngest children may unintentionally lead to less encouragement of children’s natural learning strategies, such as play, exploration, freedom to move; this can result in the overall decontextualisation of the learning process and less attention to the whole child (Kaga, Bennett and Moss, 2010^[25]). Nevertheless, despite the potential risks, current perspectives favour integration complemented with comprehensive and long-term national evaluations of system change to better understand the benefits and prevent unintended consequences.

In the recent report intituled “Key Data on Early Childhood Education and Care in Europe, 2019 Edition” (2019^[73]), it was reported that countries that provide integrated ECEC services for all children under primary school age were likely to guarantee a place in publicly funded provision for each child from an early age (6 to 18 months). Integrated systems were also more likely to provide age-appropriate educational content for all children, delivered by highly qualified staff, which can help settings improve the quality of care and learning and contribute to high standards across all ECEC services (European Commission/EACEA/Eurydice, 2019^[73]).

2.2. Equity issues in access and participation still remain a challenge in several OECD countries

An analysis of the most recent available OECD Family Database² (2017 or latest) of 0- 2 year-olds’ participation rates in ECEC reveals that several countries continue to struggle with equity issues. For instance, if one looks at differences by income tertiles, approximately half of the countries show considerable differences in access, with babies and toddlers from the lowest income families invariably showing lower participation rates than babies and toddlers from high-income families³. Noticeably, this trend is present in almost all OECD countries, even when the differences in participation do not reach statistical significance. Denmark appears as one of the countries with fewer discrepancies

² Retrieved on 6 February, 2020 <http://www.oecd.org/social/family/database.htm>

³ Data refer to children using centre-based services (e.g. nurseries or day care centres and pre-schools, both public and private), organised family day care, and care services provided by (paid) professional childminders, regardless of whether or not the service is registered or ISCED-recognised.

between low- and high-income families of babies and toddlers, with rates of 72% participation for the lowest income tertile, 73% for the second, and 76% for the highest. Germany shows a curvilinear pattern (but differences do not reach statistical significance), with a rate of 42% for the lowest tertile, 50% for the middle tertile, and 45% for the highest. Differences in Norway do reach statistical significance, with a first tertile rate of 36%, followed by 58% for the second, and 51% for the third.

The same general pattern emerges among OECD countries when looking at the participation rates of babies and toddlers by mother's education, with half of the countries yielding statistical significant differences in the expected direction: enrolment rates for babies and toddlers whose mothers have attained tertiary education (highest level of education attained at ISCED 2011 levels 5-8) are higher than babies and toddlers whose mothers have not. Again, countries vary in the magnitude of the discrepancies. For instance, Denmark does not show statistically significant differences in enrolment rates according to levels of mother education (75% vs. 74% for low- and high-levels of mother education, respectively), nor Norway (44% vs. 53%), but Germany (42% vs. 51%) does.

Although the existence of differences in access according to families' income and level of education seem to be straightforward, a word of caution is needed when discussing its causes. In fact, research is needed to shed light on the relative weight of different factors that may explain the differences. Particularly, it would be useful to disentangle causes related to service provision, such as cost or distance, from others, such as lower demand possibly due to low-income mothers' higher unemployment rates and consequent availability to take care of their children. In addition, differences in participation rates across countries should be carefully interpreted as they are influenced by the length of paid parental leave, which varies greatly across countries.

The Eurydice Report Key Data on Early Childhood Education and Care in Europe, 2019 Edition (2019_[73]), states that very few (European) countries grant universal access to free ECEC for children from the earliest years. Instead, most countries have in place targeted measures to reach the most disadvantaged, the most common of which (for children under age 3) consist on fee reductions. Measures tackling inequalities more frequently apply target measures to increase affordability, through fee reductions, than to increase accessibility (European Commission/EACEA/Eurydice, 2019_[73]). Furthermore, priority admission rules are, in many countries, decided at local or institutional levels.

In addition to inequalities in participation rates, it is possible that inequalities in the access to high-quality services also exist, but the evidence is inconclusive. Some studies have shown that children from socially disadvantaged backgrounds were more likely to attend low-quality settings (Ruzek et al., 2014_[20]). Other studies have shown the opposite (OECD, 2018_[1]). For instance, Ruzek (2014_[20]), in a study that employed a US nationally representative sample to examine the distribution of quality of toddler care, reported that low-income children were more likely than others to be cared for by their parents and, when in care, were more often in lower quality care. But a recent study from the Netherlands showed that observed process quality was higher in playgroups with a higher percentage of children who spoke another home language (Slot et al., 2017_{c[75]}). The latter results can possibly reflect a targeted policy in place through which disadvantaged children are more likely to attend centres that provide greater support for learning (Slot et al., 2017_{c[75]}). Together, the findings suggest there can be effective policy measures to tackle inequalities in the access of high-quality ECEC and that, in their absence, one is most likely to find unequal access to high-quality ECEC.

2.3. More research is needed on scaling up universal ECEC for very young children

In the current literature review, very few studies were found that try to directly measure the impact of the implementation of policy changes. Dearing et al. (2018^[76]) investigated the consequences of national scaling-up of ECEC in Norway, beginning at age 1. Through the exploration of the variation in ECEC coverage across birth cohorts and municipalities in a population-based sample (n = 63 350), the authors observed that the scale-up of universal ECEC led to improved language. Importantly, this relation was particularly strong for low-income children. Therefore, authors argue that their data encourages countries to implement publicly subsidised and regulated ECEC programmes for very young children at scale, since these have a potential benefit for narrowing achievement gaps.

However, past research has also found mixed findings of universal childcare policies on developmental outcomes. In relation to the Canadian context, Kottelenberg and Lehrer (2014^[77]) tried to investigate differential age effects on the previously observed findings that Quebec's universal highly subsidised childcare was potentially associated with declines in a variety of developmental outcomes for all children aged 0–4 years. Indeed, the study yielded differential effects according to the children's age, with younger children experiencing significantly larger negative impacts on developmental, health, and behavioural measures. The research also showed that, for children above 3 years of age, there were benefits from access to universal childcare on motor and social development. In another longitudinal study conducted in Quebec, in which long-term associations between early ECEC attendance and academic achievement in early adolescence were estimated, the authors found that low-SES children exposed to centre-based ECEC earlier in life (from 5 months) had better academic achievement than low-SES children who never attended ECEC (Laurin et al., 2015^[78]). Findings further suggested that ECEC attendance either reduced or eliminated the social inequalities in academic achievement (Laurin et al., 2015^[78]).

More recently, there have been calls for a more nuanced understanding of the effects of universal childcare on infant and toddlers' development and well-being. Some authors have called attention to the importance of looking into differential effects and its associations with the quality of the home learning environments (Kottelenberg and Lehrer, 2017^[79]). Specifically, using data from the National Longitudinal Survey of Children and Youth (NLSCY), the authors found that centre-based universal services can boost developmental outcomes for children from disadvantaged households. Taken together, the small but growing literature of studies evaluating universal child care policies suggests the importance of examining its effects across subgroups of children to better understand when and for whom a particular policy can work (Kottelenberg and Lehrer, 2017^[79]).

Importantly, the links between scaling up and levels of process quality have been largely overlooked, calling for further research in this area, considering, in particular, that increasing the access to ECEC may be associated with changes in quality features such as increases in group size (Yoshikawa et al., 2007^[80]).

2.4. Differences in quality for public and private centres are not consistent across countries

Another issue that has been subject to scientific inquiry is the potential difference in process quality between public and private centres for children under age 3 (Bjørnstad and Os, 2018^[13]; Hu et al., 2019^[81]). A publicly-managed ECEC centre generally refers to an ECEC centre managed by a public education authority, government agency, or municipality. A privately-managed ECEC centre usually refers to an ECEC centre managed by a

non-government organisation (e.g. a church, synagogue or mosque, trade union, business, other private institution or person). Understanding whether process quality is similar or different across public and private centres can inform policies about the possible solutions to improve quality. Although the number of studies is limited, and therefore results need to be interpreted carefully, the evidence points to differences amongst countries. More specifically, in Norway, no differences in observed global quality (measured using the ITERS-R) were found between municipal and private centres (Bjørnstad and Os, 2018^[13]). In contrast, in the People's Republic of China, private centres for children under the age of 3 received higher scores on observed global quality (ITERS-R) than public ones (Hu et al., 2019^[81]). The opposite results were found for preschool settings (Hu et al., 2016^[82]). In China, toddler programmes are not part of the three-year ECEC education system, and thus public centres do not receive public funding for serving toddlers. As a result, both public and private programmes rely on private resources to run toddler programmes, but tuition fees are higher in private centres. The authors hypothesise that this may result in better resources and training in private centres compared to public centres.

2.5. Home-care definitions, regulations, and practices vary significantly across countries and even within countries

Alongside centre-based ECEC, regulated home-based ECEC is a service often used by parents and families for children under age 3 in many countries (Ang and Tabu, 2018^[5]). Home-based ECEC typically involves a paid ECEC service for a child or group of children in a home setting. The literature suggests that home-based ECEC has the potential to provide a rich learning environment for young children, and to effectively support individual families' needs who may need flexible childcare (Ang, Brooker and Stephen, 2017^[83]).

The literature has pinpointed great variation in the arrangements, regulations, coverage, and enrolment rates across countries in home-based provisions (OECD, 2018^[1]). In the Flemish Community of Belgium, Denmark, Finland, Germany, and Iceland, home-based provision represents a significant proportion of ECEC, although in Germany there is a large variation across Länder. In contrast, in Italy, Norway, Portugal and Spain home-based provision is of minor importance (European Commission/EACEA/Eurydice, 2019^[73]).

In addition to variations in enrolment rates, great disparities in regulations appear to exist. Some studies showed to be substantial variation in home-care provision regarding the age of the children, whether provision of care included one provider (e.g. England, United Kingdom) or allowed for assistants (e.g.. Japan), the type of accreditation required, and professional development demands. For example, regulated home-based care in Japan caters specifically to children under the age of 3, while UK regulations allow for home-care (referred as childminding) up to the age of 8 (although with differences in ratios according to children's ages (Ang and Tabu, 2018^[5])). In Colombia, home-based provision serves children from 6 months up to 6 years (Bernal et al., 2019^[84]).

Group sizes and child-staff ratios tend to be lower in home-based settings than in centre-based settings [e.g. OECD (2018^[1])], but there is also considerable variation across countries. Regarding ratios, Japan requires one caregiver for up to three children, or five if childcare assistants are recruited to work alongside the main provider or caregiver. In the United Kingdom, childminding providers may care for up to a maximum of three children under the age of 5, and for a maximum of six children under the age of 8 at any one time

(Ang and Tabu, 2018^[5]). In Colombia, home-based ECEC can serve between 12 and 15 children (Bernal et al., 2019^[84]) per provider.

Additionally, several authors have called attention to the diversity of home-based provision within countries (Tonyan, Paulsell and Shivers, 2017^[85]). For instance, in the US context, Schaack et al. (2017^[86]) highlighted within-country variation regarding license requirements for home-based settings, i.e. from state to state, making it possible for a provider to be required to have a license in one state but not in another state (Schaack, Le and Setodji, 2017^[86]). The diversity of the arrangements together with the variation in regulation across states and countries have created barriers to building a solid research base on the association between this type of provisions and development and well-being for the youngest children (Tonyan, Paulsell and Shivers, 2017^[85]).

Nevertheless, some studies have examined whether process quality across home-based provision varies as a function of licensing status. Although caution is needed when interpreting empirical evidence on the effects of licensing status, as licensing and regulation requirements vary greatly across and within countries, it seems plausible that licensing is related to higher levels of process quality (Raikes et al., 2013^[87]; Tonyan, Paulsell and Shivers, 2017^[85]). Licensed home-based settings may be required to comply with a set of regulations and directives, such as child-to-adult ratios, training, and supervision, which can increase the likelihood of more favourable ratios, specialised training in child development or provision of a safer physical environments (Raikes et al., 2013^[87]). In one study examining quality differences across licensed and non-licensed home-based settings, with a sample of 514 US home-based settings, differences were found favouring licensed home-based settings on quality features such as health and safety, space and furnishings, as well as features related to learning activities and social development (as measured by FCCERS). Interestingly, no differences were found on the levels of warmth, harshness or detachment (as measured by the CIS) among providers. Even though caution is needed when attempting to draw generalisations from this research, increased regulation may represent an avenue for possible policy change (Tonyan, Paulsell and Shivers, 2017^[85]).

2.6. Home-based ECEC associated with less regulation and poorer quality, but exceptions appear

Some evidence suggests that home-based provision is under-regulated in Canada and the United States (Schaack, Le and Setodji, 2017^[86]; White et al., 2019^[88]), particularly in regard to the educational qualifications of the providers. According to White et al.'s (2019^[88]) rationales for under-regulation relate to pragmatic political concerns over quality and safety, such as costs associated with licensing and worries about choice and accessibility.

Overall, the literature suggests that staff in home-based settings for children under age 3, in comparison to staff working in centre-based settings, is less likely to have higher educational qualifications and specialised training in early childhood (Bigras et al., 2010^[89]; Eckhardt and Egert, 2018^[4]; Groeneveld et al., 2010^[90]; OECD, 2018^[1]). Home-based providers are also more likely to have less access to resources and supports and fewer opportunities for professional development than centre-based staff (OECD, 2018^[1]; Tonyan, 2017^[91]). Research further suggests that home-based providers often work alone and thus face a range of additional challenges such as fewer opportunities to share ideas with others about how infant and toddler development and engagement and how to involve children in the activities (Porter et al., 2010^[92]; Tonyan, 2017^[91]).

Although limited, the literature suggests that the quality of the interactions provided in home-based settings for children under age 3 is lower in comparison to centres (Bigras et al., 2010_[89]; Lahti et al., 2015_[68]; OECD, 2018_[1]). Specifically, home-based settings have been rated lower in respect to the organisation of learning activities and interactions between staff and children (Bigras et al., 2010_[89]). Other studies suggest that home-based settings provide lower levels of cognitive stimulation (Tonyan, 2017_[91]). Moreover, compared to centre-based settings, home-based settings have been found to provide lower levels of support for play in infancy and toddlerhood (Lemay, Bigras and Bouchard, 2016_[93]).

But there are exceptions to this trend (Groeneveld et al., 2010_[90]). For instance, in one study conducted in the Netherlands that compared the levels of quality and children's wellbeing in home-based and centre-based settings, the results showed that toddlers in home-based settings experienced higher caregiver sensitivity and showed higher well-being compared to toddlers in centre-based provision (Groeneveld et al., 2010_[90]). In a study conducted in Colombia, even though process quality in both centre-based and home-based were deemed low, it was significantly worse in centres in comparison to home-based settings (Bernal et al., 2019_[84]). The study, which included a cluster-randomised control trial of 2 767 children between the ages of 6 and 60 months, examined the effects of the transition from home-based to centre-based provision on children's health and development. Additionally, it showed that children's transition to centre-based settings was related to poorer cognitive development, but better nutrition (Bernal et al., 2019_[84]).

Taken together, the literature indicates that, although some structural characteristics are beneficial in home-based settings, such as a smaller group size or smaller child-to-staff ratios, other features can be less positive, such as staff's lower educational qualifications, which likely affects the levels of process quality (OECD, 2018). But most importantly, the literature reveals that home-based settings show wide variation in terms of arrangements, regulations, educators' practices, and children's experiences, justifying the need for more research in the area.

2.7. Unclear if centre vs. home-based care divide is attached to equity issues

Some literature discusses equity issues along the centre-based and home-based divide. In a comprehensive literature review on home-based ECEC covering published international work from 1990 to 2013 and including countries such as Australia, Canada, New Zealand, the United Kingdom and the United States, Ang et al. (2017_[83]) suggest that home-based ECEC was more likely to be used by vulnerable families, compared to centre-based settings. The authors argued that this was due to the lower costs and flexibility in accommodating non-traditional working schedules in home-based provision in comparison to centre-based, as well as the lack of availability of centre-based slots for very young children.

Nevertheless, Coley (2014_[94]), in a study that used a nationally representative sample from the the United States, did not find any statistical differences between parents' income and the use of centre-based vs. home-based care for children under the age of 3. It is important to highlight that the statistical models did include a significant number of covariates (such as education level, ethnic background, rural vs. urban settings, health-related variables) which grants additional robustness to the analysis and results found (Coley et al., 2014_[94]).

A more recent study, conducted in Germany, found that the proportion of dual language infants and toddlers in groups was significantly lower in home-based provision when compared to infant/toddler centres (Eckhardt and Egert, 2018_[4]). One possible explanation

might hinge on specific implemented policies that directly aim at increasing disadvantaged families' participation in ECEC centres.

2.8. Lower participation of home-based provisions in quality improvement strategies

Initiatives for enhancing the quality of early care and education have been put into place, particularly in the United States, where almost all states are currently developing Quality Rating and Improvement Systems (QRIS) (Hooper, 2019^[95]). QRIS are available for both home- and centre-based providers, but home-based centres tend to participate at lower rates (Hallam et al., 2017^[96]; Hooper, 2019^[95]).

The current literature review yielded very few studies on the effects of quality improvement strategies on quality of ECEC for children under age 3. A study (Yazejian and Iruka, 2015^[97]) investigated the impact of Florida's tiered QRIS — which included educational scholarships for staff, on-site technical assistance, as well as financial awards for materials and equipment — among centre-based programmes (N = 342) and home-based (N = 70) within Miami-Dade County, between 2008 to 2013. The findings documented that process quality increased over time across both types of ECEC (centres and homes), with the duration or amount of time in the programme significantly related to quality change. In a QRIS six-month intervention involving 52 home-based providers, results revealed a positive impact of the intervention on the observed quality scores (measured through the Family Child Care Environment Rating Scale-Revised) and at the 6-month follow-up, although no effect appeared on the overall QRIS rating (Boller, Paulsell and Raikes, 2015^[98]). Possible explanations for finding a positive impact of the quality improvement intervention on quality scores but not on QRIS scores may relate to the way the QRIS overall ratings are computed. The authors call attention to the QRIS rating approach emphasising that it was very strict and underestimated the relative contribution of the observed quality scores to the overall rating. Thus, how the QRIS overall rating is computed can mask positive impacts of the quality improvement programmes, making it important to bring into discussion the QRIS rating models.

Nevertheless, and despite the availability of these QRIS initiatives for home-based ECEC, there still seems to be a lack of consensus for how to best support quality improvement within QRIS. Although there are few studies examining the effects of specific quality improvement initiatives on process quality, the available research favours a tailored approach to quality improvement, namely one that allows providers to select what they perceived as more useful from a menu of existing services (Hooper, 2019^[95]).

3. Staff qualifications and working conditions

One of the most studied aspects to understand the provision of quality of care and education for young children relates to staff's qualifications and working conditions, as these are increasingly acknowledged as providing the staff with the competences and support needed to enhance or maintain high-quality interactions. This chapter reviews the literature that addresses the links between staff's pre-service training, licensing guidelines and procedures, Professional Development (PD) opportunities, and process quality.

3.1. Higher qualifications are associated with higher process quality in infant/toddler centre-based care

There is extensive literature showing that higher levels of pre-service qualifications are associated with higher-quality staff-child interactions (OECD, 2018^[1]; Barros et al., 2018^[37]; Castle et al., 2016^[99]; Kalliala, 2011^[100]). A recent meta-analysis (Manning et al., 2019^[101]) has strengthened this general finding, reporting that higher teacher qualifications were positively associated with higher process quality in centres, including in domains such as language and reasoning stimulation. Nevertheless, it is important to notice that although this meta-analysis involved more than 70 distinctive samples, only a small number of studies on infant/toddler classrooms/playgroups were included.

Furthermore, it is noteworthy that the relation between teachers' qualifications and process quality has been documented across several contexts. Recent studies from Australia, China, Germany, Norway, Portugal, and United States have shown educators' preservice education to be associated with higher levels of process quality in infant/toddler centre-based care (Degotardi, Torr and Han, 2018^[102]; Barros et al., 2018^[37]; Bjørnstad and Os, 2018^[13]; Hu et al., 2019^[81]; Castle et al., 2016^[99]) and home-based provisions (Schaack, Le and Setodji, 2017^[86]).

One key aspect to better understand the relations between professionals' preparedness and qualifications on the one hand, and process quality on the other, is to disentangle the differential effects of the different facets underlying the concept of process quality, as well as the concrete aspects or ingredients of professionals' characteristics and training.

Regarding the specific domains of process quality, some of the studies demonstrate that educators' preservice education may be particularly determinant for the language-learning environment provided for infants (King et al., 2016^[103]), namely the level of clarity and reasoning involved in educators' talk (Degotardi, Han and Torr, 2018^[104]; Hu et al., 2019^[105]). Similarly, Barros et al. (2018^[37]) found that having a qualified lead educator was associated with higher quality in the domains of Facilitated Exploration, i.e. levels of educators' active involvement and provision of exploration opportunities and encouragement to all infants, and Early Language Support, i.e. levels of expansion of infant vocalisations and other communication attempts. The findings appear to suggest that holding a university-level qualification may contribute to more complex and multifaceted ideas about infants and their linguistic and cognitive development, which can then help educators to be aware and encourage infants' attempts to explore and communicate. There is also some evidence that qualifications can contribute to the levels of educators' sensitivity (Barros et al., 2018^[37]; Schaack, Le and Setodji, 2017^[86]) and interpretive complexity (Degotardi, 2010^[106]), helping the caregiver to appropriately read child cues and respond accordingly. Overall, such results might indicate that preservice training may be particularly relevant for cognitive and language-supportive interactions that may imply

more intentionality. Nevertheless, a study with a representative sample of the Dutch ECEC system (including 162 centres with a total of 276 playgroups) found that teachers' formal pre-service education showed a positive small association with emotional, but not with educational process quality, as measured by CLASS-toddler (Slot et al., 2015^[107]), suggesting the relevance to further study specific domains of process quality in order to better understand its associations with preservice training.

While some studies have focused on the level of educators' qualifications, for example showing the positive effects of a university-level degree compared to lower qualifications (Barros et al., 2018^[37]; Bjørnstad and Os, 2018^[13]), others have looked specifically at the impact of educators' specialised training on working with infants and toddlers (Hu et al., 2019^[81]; Schaack, Le and Setodji, 2017^[86]). Overall, the latter studies suggest that specialised training in working with infants and toddlers is critical to high process quality. The studies also stress the need for more research on the content of educators' preservice courses to better understand relationships between process quality and educators' formal education (Eckhardt and Egert, 2018^[4]; Loizou and Recchia, 2018^[36]; Schaack, Le and Setodji, 2017^[86]). For instance, in one study conducted in Germany, the authors found that playgroups with teachers who receive specific pre-service training in the area of early education and care (Pädagogische Fachschule) had higher levels of process quality compared to playgroups where teachers received other kind of training, but clearly more research is needed (Eckhardt and Egert, 2018^[108]).

3.2. Beyond qualifications and working conditions: interplay between teachers' characteristics and perspectives

On top of the relations between process quality and staff's qualifications and working conditions, several studies have probed other aspects related to staff that might play a relevant role, such as teachers' characteristics and perspectives. For example, in a study based on the NICHD data collected at 15, 24, and 36 months of age involving 740 early care and education teachers, with the objective of untangling the teacher characteristics associated with effective teaching beyond education and experience, Thomason and Paro (2012) have put forward the concept of teachers' commitment to the field of early care and education. Teachers' commitment was defined as including job satisfaction, perception of the job as a long-term career, education level, years of experience, and membership in a professional organisation. According to the study, teachers' commitment significantly predicted the quality of teachers' emotional and cognitive support provided to children (assessed through the ORCE), with the effect being stronger on the cognitive support than on the levels of emotional support provided by teachers in playgroups (Thomason and La Paro, 2013^[109]).

On another research thread, several studies have focused on teachers' perspectives for several purposes: to understand what teachers value, helping to get a nuanced understanding of quality that is contextualised and culturally appropriate (Massing, 2018^[110]; Smith et al., 2018^[111]); to better understand teachers' current understanding and knowledge gaps (Clarke, McLaughlin and Aspden, 2019^[112]; Ellis, Cliff and Okely, 2018^[113]); to better inform Professional Development needs and interventions (Degotardi and Gill, 2019^[114]). Overall, although most studies are small-scaled, preventing the generalisation of their findings, they contribute to a line of inquiry on ECEC quality that calls for the importance of considering teachers' beliefs in quality improvement efforts. Even though observational standardised measures have been the gold standard for quality assessment, combining them with assessment of teachers' beliefs can help bring into light current needs, preferences and practices that can add to culturally appropriate means of quality improvement. For example, in one study, the authors found that the accuracy

consistency of caretaking behaviours and responsiveness to individual infant's needs was influenced by the caregivers' care and educational philosophies, dedication, as well as congruent belief systems with other team members (Kim, 2016_[115]). In a study conducted in Korea, results showed that teachers defined their role as 'teacher as mother', and placed more emphasis on nurturing than educating, framing centre-based infant/toddler care as non-ideal and only a second option, namely when mothers were not available for primary caregiving (Park, Sungeun and Wee, 2014_[116]). In another study from Norway, teachers put great emphasis on the influence of full-time day-care attendance on young children, referring that despite of the good quality of the experiences, with a relatively low child-to-adult ratio and very experienced caregivers with high educational qualifications, most children became very tired at the end of the stay (Undheim and Drugli, 2012_[117]). Teachers emphasised the close cooperation with parents regarding sleeping habits to determine resting strategies and expressed sensitive attitudes towards the individual needs of the children. Teachers' emphasis on children's tiredness over the day led them to set out additional resting and relaxing strategies, which were not needed if children spent fewer hours in ECEC. Thus, when examining service quality, features such as dosage may call into attention additional quality features that are important from the teachers' point of view. Addressing teachers' perspectives can therefore be informative to enhance the contextual and cultural relevance of the quality concept, helping to bridge gaps between theoretical quality criteria and practice improvement.

One longitudinal study that has examined attitudes and beliefs across family- and centre-based ECEC providers of infants and toddlers has shown that centre-based providers' caregiving behaviour was more heavily influenced by attitudes than home-based (Susman-Stillman, Pleuss and Englund, 2013_[118]). While there is still much to learn about the role of attitudes and beliefs on caregiving behaviour, the results elucidate that differences between centre and home-based providers warrant further attention and should be addressed in professional development efforts.

One aspect that is important to bear in mind in relation to the available literature is the almost exclusive focus of the studies on the lead educator, despite the fact that most centre infant/toddler groups have multiple educators. Consequently, there is limited evidence on the influences of pre-service education of the multiple caregivers in infant or toddler classrooms/playgroups. In one study that tried to address the role of multiple caregivers, the results suggested that university-qualified early childhood educators compared to lower levels of qualification were likely to play an important role on process quality, not only directly by interacting with children, but also indirectly through teamwork (Barros et al., 2018_[37]). In a study conducted in Norway assessing the quality of caregivers' interaction skills, although assistants generally scored, as expected, lower on the interactional skills than teachers, differences were surprisingly not smaller between teachers and assistants in the same groups than from different groups (Bjørnstad et al., 2019_[119]). The authors further call attention to the teamwork and the potential benefit of qualified teacher-led teams, emphasising the importance of providing PD for all staff members within a group, as well as opportunities for ECEC teachers to act as models for their assistants (Bjørnstad et al., 2019_[119]).

3.3. Quality in home-based settings for the youngest may be more dependent on beliefs than qualifications

As previously noted, studies that specifically focus on home-based settings are generally scarce in comparison to the ones focused on centres. This is also the case when it comes to the relation between professionals' qualifications and quality, with our literature review finding few studies that directly address this issue. Nevertheless, the available literature

points to some differences between contexts and countries and seems to indicate that what is known about centre-based might not directly apply to home-based settings. Concretely, even though positive links between educators' preservice education and home-based quality have been established in the United States (Schaack, Le and Setodji, 2017_[86]), studies conducted in Germany suggested that educators' preservice was more strongly related to high quality in centre-based care than in family-based services (Eckhardt and Egert, 2018_[108]). In Germany, there was greater variation on educators' qualifications in family childcare and rates of pedagogical qualification were lower when compared to centre-based care. In addition, whereas process quality in centre-based care was clearly associated with educators' qualification, in family childcare educators' educational beliefs were one of the most important predictors (Eckhardt and Egert, 2018_[4]).

3.4. Promising effects of participation in continuous professional development (CPD) and better working conditions on process quality

Notwithstanding the growing interest in understanding the effects of Professional Development (PD) on process quality (Hooper, 2019_[95]), robust evidence on this issue is still scarce. The available evidence so far seems to suggest positive benefits from professionals' engagement in PD (Helmerhorst et al., 2017_[120]; Loizou and Recchia, 2018_[36]; Linberg et al., 2019_[121]; Slot et al., 2015_[107]; Groeneveld et al., 2010_[90]; Moreno, Green and Koehn, 2015_[122]), with studies reporting several gains from diverse forms of PD.

For instance, in a study with a representative sample of Dutch centres, the use of an education programme and PD activities (reported by teachers) at the centre showed the strongest associations with emotional and educational process quality, in comparison to other features such as group size and child-to-teacher ratio (Slot et al., 2015_[107]). Another example, from Germany, reported that more hours in advanced training in the last 12 months were related to higher observed quality both in centre and home-based (Linberg et al., 2019_[121]). Nevertheless, this relation did not fully hold true in one study involving Portuguese infant classrooms/playgroups, which found no effects of attending PD in the past two years for high-qualified educators, though a positive association was found for those with no qualification (Barros et al., 2018_[37]). This might suggest that the strength of the relation between PD and quality improvement may be dependent upon the qualification level of the professionals. It may also be that the PD programmes were not of high enough quality or intensity, calling into question the importance of analysing PD programmes in detail.

Other studies conducted in Cyprus⁴, Italy, Netherlands, Portugal, and the United States suggest promising results for professional development programmes characterised by practice-focused components, such as opportunities for reflection based on practice (Chen, Martin and Erdosi-Mehaffey, 2017_[123]; Loizou and Recchia, 2018_[36]; Moran et al.,

⁴ Note by Turkey:

The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

Note by all the European Union Member States of the OECD and the European Union:

The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

2017_[124]), observation or videos of practice in context (Donegan-Ritter and Van Meeteren, 2018_[125]; Loizou and Recchia, 2018_[36]; Moran et al., 2017_[124]; O’Flaherty et al., 2019_[126]; Helmerhorst et al., 2017_[127]), pedagogical challenges tailored to the needs of the teachers (Loizou and Recchia, 2018_[36]), self-reflection (Donegan-Ritter and Van Meeteren, 2018_[125]), context-based approaches that use problems of daily life as starting points for reflection (Oliveira-Formosinho and Araujo, 2011_[128]), sustained opportunities for observation, recording and interpretation (Araújo, 2012), teamwork and collaboration (Araujo, 2012_[129]; Moran et al., 2017_[124]), as well as through the use of action-research methodology (Molina, Marotta and Bulgarelli, 2016_[130]).

The study by Helmerhorst et al. (2017_[127]) stands out due to its unusual robust design, on the one hand, as well as its focus on centres’ directors, in addition to educators, on the other. The study, conducted in the Netherlands, examined the effects of a newly developed on-site consultancy programme on process quality through a randomised controlled trial with a pre-test, post-test, and follow-up (Helmerhorst et al., 2017_[120]). The intervention, directed at centre directors, aimed at improving the quality of the environment in four specific areas: space and furnishings, language, activities, and programme structure. The results demonstrated a significant positive effect of the intervention for the process quality domains targeted during the consultancy, with no effects found for global process quality. Considering that global process quality is the computed average across all dimensions, it seems that, for some dimensions, positive effects were found while for other dimensions, no such effects were observed. It appeared that the improvement was specific and was directly linked to the exact focus (targeted process quality domains) of the consultation.

Parallel to the consultancy programme for centre directors, the team developed a 5-week video feedback training for educators, with the aim to improve educator–child interactions. Individual training sessions were carried out, in which the trainer and educators watch video case examples and educators’ own interactions and discussed together educators’ behaviour, based on a set of predefined criteria. The results indicated that the training had a positive effect on several educators’ interactive skills, namely sensitive responsiveness, respect for autonomy, verbal communication, developmental stimulation, and fostering positive peer interactions (Helmerhorst et al., 2017_[127]).

Other robust studies, namely with RCT designs, have reported positive effects from interventions under different rationales. The study of Biringen et al. (2012_[131]) concluded that a brief (3-4 sessions) emotional educational training sufficed to alter both care provider–child emotional availability and attachment security to the care provider in ECEC centres, with a moderate effect size (Biringen et al., 2012_[131]). Landry’s et al. (2014_[132]) RCT tested an intervention targeting low-income 2- and 3-year-old children that consisted on the use of a comprehensive curriculum, as well as a set of responsive teacher practices, derived from attachment and sociocultural theories. The authors observed several gains (in comparison to the controls) in teachers’ responsive practices, despite no differences found in teacher behaviours for focal areas such as sensitivity and positive discipline supports (Landry et al., 2014_[132]). Furthermore, children who benefited from the intervention showed greater social and emotional developmental gains, though similar cognitive skills (language, literacy, and math). Groeneveld and colleagues (2011_[133]) conducted an RCT to gauge the effectiveness of a video-feedback intervention in the promotion of home-based ECEC quality. Using the CIS and the Infant Toddler Child Care Home Observation for Measurement of the Environment inventory (IT-CC-HOME), the authors reported gains in process quality for the intervention group (in comparison to the control), although the programme did not seem to produce change in the observed caregivers’ sensitivity. Moreno’s et al. (2015_[122]) study aimed at assessing one-on-one coaching PD interventions’ effectiveness, that aimed for the improvement of the quality of care provided by caregivers in both centre- and home-based infant–toddler ECEC settings.

The study concluded that the most intensive intervention (15 hours of coaching on top of the regular course, in comparison to 5 hours or none) displayed the most consistent pattern of improvements (measured by the CLASS), namely on the quality of interactions (support for language and learning). Lastly, the RCT assessment of the implementation of a 6-month QRIS intervention (Boller, Paulsell and Raikes, 2015^[98]) showed that QRIS quality improvement supports (coaching and grants) were effective in improving observed quality in home-based settings.

Similarly, for home-based settings, several authors have called attention to the fact that key successful PD indicators might differ across varying types of home-based providers, according to their specific motivations and barriers to professional development and quality improvement (Tonyan, 2017^[91]). Specifically, even though some authors stress the value of coaching, consultation visits, and peer networking as part of relationship-based PD services for home-based providers (Bromer and Korfmacher, 2017^[134]), recent studies highlight that the home-based provider workforce represents a widely varying field, with a multitude of particular PD needs, even distinct from those experienced by centre-based providers (Hooper, 2019^[95]; Tonyan, 2017^[91]). Overall, even though more research is needed, recent views from the ECEC literature suggest that PD components should be aligned with specific needs and goals to better increase their effectiveness to educators' improvement quality practices.

A small number of studies have examined whether affiliation within a network influences the quality of the home-based provision. It is believed that networks or organisations that offer on-going support and PD can lead to higher levels of process quality (Bromer et al., 2009^[135]), but findings have been inconsistent (MeMoQ, 2020^[136]; Bromer et al., 2009^[135]; Raikes et al., 2013^[87]). For instance, in one study from the United States involving 150 home-based settings, quality levels were compared based on the affiliation status of the settings. Home-based providers who were affiliated with a network were defined as receiving PD from at least one paid staff person who also provided ongoing oversight and support to them. The results showed that overall process quality was higher in network-affiliated home-based providers. In addition, network-affiliated providers were also less likely to be critical, exhibit harsh behaviour, or to emphasise obedience and control when compared to unaffiliated providers (Bromer et al., 2009^[135]). However, in a recent study conducted in Belgium, there were no differences between non-affiliated and affiliated providers (MeMoQ, 2020^[136]). According to the authors, although supervision through home visits and groups meetings were ensured for affiliated providers, there were no official prescriptions on how the supervision should be put in place, potentially leading to great variations on the type and intensity of supervision, which could therefore explain the lack of differences (MeMoQ, 2020^[136]). As stated by Doherty (2015^[137]), it may be that the detection of positive effects of affiliation is dependent upon the kind of PD provided and the frequency of home visits, as well as specific individual and contextual needs.

Several recent studies have also pointed to the importance of partnerships among ECEC settings and community-based family services for offering additional PD opportunities (Halle et al., 2019^[53]; Levere et al., 2019^[54]). The goal of these partnerships is to provide comprehensive services to low-income infants and toddlers and their families, as well as to increase the supply of high-quality early care and education. Results from a nationally representative survey of Early Head Start Centres in the United States showed that partnerships allowed educators an increased access to professional development opportunities, in addition to offering children and families more comprehensive services (Levere et al., 2019^[54]). In the study, a large percentage of educators were involved in PD, namely in coaching, one-on-one training, or online training. Although partnerships also bring risks (Halle et al., 2019^[53]), the studies suggest that implementing early care and

education collaborations can be a means to increase PD and thus a potentially important policy lever to support the expansion of high-quality early care and education.

3.5. Responsiveness to intervention possibly dependent upon professionals' starting point

Kalliala (2011_[100]), in an experimental intervention that tried to gauge impact of the Kangaroo programme in Finnish day-care centres for children under age 3, concluded that adults' sensitivity and activation skills improved with the intervention only when the starting level of professional qualifications and motivation was sufficiently high (Kalliala, 2011_[100]). In the same line, Helmerhorst et al. (2014) also suggested that the creation of an interaction profile for individual caregivers may serve as a starting point for professionals' PD aiming at improving the quality of caregiver–child interactions. What is more, some skills might be already present or easier to foster, while others might be lacking and/or difficult to promote (Helmerhorst et al., 2014_[138]). For example, authors from the latter study reported that caregivers scored higher on the more basic interactive skills of sensitive responsiveness and respect for autonomy than on the more educational skills of verbal communication, developmental stimulation, and peer interaction support.

3.6. Staff well-being might breed process quality (and PD can play a role)

Staff working conditions, such as staff salaries and well-being can play a key role in supporting high-quality educator-child interactions (OECD, 2018_[1]). Consistent with past research, recent research for under 3s has found links between professional well-being and process quality (Cassidy et al., 2017_[139]). Specifically, one study in the United States examined the associations between process quality and professional well-being of educators, including educator feelings about their work, autonomy in decision-making, actual wages, and perceptions of fairness of wages. The findings showed that educators' ability to make decisions was associated positively with process quality. In the opposite direction, educators who perceived that their salary was not fair in comparison to others in the profession were in playgroups rated lower in process quality (Cassidy et al., 2017_[139]). Professionals' salary has also been found to correlate with higher levels of process quality in China and the United States (Hu et al., 2019_[81]; Pauker et al., 2018_[29]). Although the empirical evidence is somewhat limited, concerns regarding poor working conditions, particularly in regard to infant playgroups, such as low salaries and unpleasant organisational climate, have been identified as potential barriers to high-quality practices (Chan, 2019_[140]). Overall, the few studies that empirically examine working conditions and its associations with process quality highlight that organisational features may raise opportunities or constraints to educators' practices, but more research is needed.

Incidentally, PD support — or, at least, some forms of it — might well play a role in staff well-being. As Boller and colleagues (2015_[98]) discuss about the success of QRIS intervention, one of the main disruptions in delivering such an intervention relates to staff turnover. The authors conclude that investments in the early childhood workforce may improve staff satisfaction and retention, which can help sustain PD effects.

4. Structural features at the setting and group levels

This chapter focuses on the structural characteristics of settings and groups. Some structural features such as group size and adult-child ratios have received considerable attention from researchers (OECD, 2018^[1]), with the produced evidence generally confirming that smaller group sizes and better staff-to-child ratios are associated with higher process quality in centre-based settings. Although less studied, other features have been found to be relevant, namely the size of centres and age diversity of the child group (OECD, 2018^[1]). In comparison to centre-based, home-based settings have been under-studied (OECD, 2018^[1]). Furthermore, the evidence available seems to indicate that the relations found for centre-based settings do not necessarily hold for home-based settings, increasing the need for studies that explicitly address the specificities of home-based contexts.

4.1. Smaller groups and better ratios mean higher-quality experiences for the youngest in centres

Previous literature has associated smaller group sizes with higher process quality in centre-based settings (Barros et al., 2016^[141]; Helmerhorst et al., 2015^[142]; OECD, 2018^[1]). More recent studies have added to this body of literature, with group size showing to be negatively correlated with process quality in studies from several countries, namely Australia, Germany, Netherlands and China (Degotardi, Han and Torr, 2018^[104]; Helmerhorst, Colonesi and Fukkink, 2019^[143]; Hu et al., 2019^[81]).

Similarly, better staff-to-child ratios, i.e. less children per adult, have been positively associated with process quality in Ecuador, Netherlands, Norway, China, and Portugal (Bjørnstad and Os, 2018^[13]; Helmerhorst et al., 2015^[142]; Hu et al., 2019^[81]; Lopez Boo, Dormal and Weber, 2019^[144]; Pessanha et al., 2017^[145]). It should be noted, however, that another study involving a nationally representative sample of Dutch child centres, did not find group size or child-to-staff ratio to be related to emotional or educational process quality (assessed by CLASS-toddler). The authors refer that this finding is perhaps due to the limited variation of these structural characteristic within the Dutch system (Slot et al., 2015^[107]).

One study conducted in Portugal examined child-to-staff ratios and process quality longitudinally, across two times of data collection, making it possible to examine whether changes in ratios were linked to process quality. The results showed that increases in child-to-staff ratios over time were associated with decreases of educator-child interaction quality in infant playgroups (Pessanha et al., 2017^[145]).

It should be noted, however, that studies also reported that some structural aspects go hand in hand with others, making it difficult to disentangle the effects of each structural aspect separately (Castle et al., 2016^[99]). For instance, in Australia it was found that group size and educator-infant ratio were negatively correlated (Degotardi, Han and Torr, 2018^[104]). In Norway, one study set itself to compare the levels of quality between small and stable groups within their own playgroups (8–19 children) and more flexible groups of 20-56 children that shared playgroups and interest areas (Bjørnstad and Os, 2018^[13]; Løkken et al., 2018^[146]). The findings showed that small and stable groups scored higher in global quality than flexible groups, but it is not possible to disentangle whether this is due to the stability of the group or its size. In the United States, in one study looking into the quality of language and literacy environments, the authors found a joint effect of high qualifications, smaller group sizes, and better teacher-child ratios on quality (Norris,

2017_[147]), without being possible to identify which specific features were associated with better language and literacy environments.

4.2. Size and mixed aged groups seem to negatively associate with quality in centres

Most studies focus on group sizes and staff-to-child ratios rather than on centre size. In one notable exception, conducted in Germany, the authors examined the number of playgroups per centre, a proxy for centre size, and its associations with observed process quality, finding that more rooms per centre were related to lower scores of observed quality (Linberg et al., 2019_[121]).

In regard to the age composition of the groups, the few studies included in the present review that have looked at its association to quality have shown that mixed-age groups or groups with greater age ranges (defined as the difference between the oldest and the youngest child in the group) were negatively associated with global process quality (ITERS-R) in centre-based care in Germany (Eckhardt and Egert, 2018_[108]; Linberg et al., 2019_[121]).

4.3. Home-based research is needed, but available evidence indicates differential effects from centre-based research

As stated, robust available evidence for home-based settings is generally scarce, and this is also true when looking into the specific relation between structural features and process quality. Moreover, the few studies retrieved that explicitly distinguish between the two types of settings have found differential relations between them.

This was the case with two studies conducted in Germany that looked at the associations between ratios and process quality, with the authors concluding that structural characteristics played an important role in understanding process quality in centre-based care, but that this relation was weaker for family child care (Eckhardt and Egert, 2018_[4]; Linberg et al., 2019_[121]). Similarly, in another study conducted in Canada that specifically focused on the associations between ratio and aspects of process quality, such as number of one-on-one interactions and the quantity of speech heard by the child, the authors found no clear patterns in home-based ECEC settings in contrast to centre-based (Soderstrom et al., 2018_[148]).

Yet another difference between the two types of settings appeared regarding the age composition of groups, with the one study retrieved reporting no relation with process quality in home-based settings, whereas for centres, such association was found (Linberg et al., 2019_[121]). Overall, even though past research from the United States has suggested that the association patterns between structural features and process quality is similar across centre- and home-based settings (e.g., (Bigras et al., 2010_[89])), the most recent research, although limited, suggests that the pattern seems to be more complex for home-based provision, possibly due to a greater variation within the home-based ECEC provision.

5. Process quality – new perspectives and insights

Although the literature on process quality for children under age 3 is somewhat limited, several recent studies are expanding the current evidence by pointing to limitations of the traditional measures of process quality and suggesting that the way to advance current knowledge hinges on the unpacking of the “black box” for quality, namely through the differential study of novel quality dimensions, encompassing peer and group processes, and addressing the issue of stability/homogeneity of quality, across different caregivers within the same playroom, within group (vs. at the child level), and across time (day and years). In fact, the issue of continuity and stability of care, in particular the stability of the educator across year(s), has recently been under scientific inquiry.

5.1. Unpacking the “black box” for quality

A growing body of evidence has been implying that traditional measures of process quality may not accurately reflect the daily experiences of young children, suggesting the need for more fine-grained measures and more nuanced research on children’s interactions with their social and physical environments (Hooper and Hallam, 2017_[149]). For example, in one recent study from Australia, there were no significant direct effects of global quality (as measured by ITERS-R) on toddlers’ daily movement behaviours. However, some of the quality domains, such as Personal care routine and Activity were positively associated with toddlers’ time spent on moderate-to-vigorous physical activity (Zhang et al., 2018_[150]). In another study from the United States, higher emotional and behavioural support (as measured by the CLASS) was associated with higher levels of engagement and emotional regulation, whereas no such links were found for Engaged Support for Learning (Choi et al., 2019_[57]). Similarly, in a study conducted in the Netherlands, higher emotional and behavioural support in toddler playrooms was a predictor of better social competences (Broekhuizen et al., 2018_[151]). Another study from the United States further showed that emotional and behavioural support was associated with teacher-reported toddler behaviour problems, but not with social-cognitive outcomes (Kwon et al., 2019_[58]). In contrast, the levels of educators’ active facilitation of children’s exploration of the environment were positively associated with social competence, engagement and emotional regulation (Kwon et al., 2019_[58]). Additionally, overall, these studies point to the need to look carefully to the quality dimensions under study, as they may be differentially impact the development of children’s outcomes.

5.2. Acknowledging the importance of peer and group processes

Recent studies have also examined quality aspects that are not part of the most widely used measures of process quality, such as teachers’ support of peer and group processes (Redder and White, 2017_[152]; van Schaik, Leseman and de Haan, 2018_[153]). It has been argued that peers, since a very young age, play a crucial role in infant and toddler groups (Pastori and et al., 2015_[154]; Redder and White, 2017_[152]). Among children as young as babies, peer social interactions involve reciprocity, joint attention, and mutual affect, with children learning to observe each other, helping each other and playing together (Redder and White, 2017_[152]; van Schaik, Leseman and de Haan, 2018_[153]). Young children’s everyday social experiences with their peers are therefore foundational for social development and can be a key-factor in supporting children’s learning and socio-cognitive development (Pastori and et al., 2015_[154]; Redder and White, 2017_[152]). Acknowledging the importance of peer processes, some studies have investigated how educators can better support peer

relationships and group interactions in children under age 3 (van Schaik, Leseman and de Haan, 2018_[153]; Williams, Mastergeorge and Ontai, 2010_[155]). In one study conducted in the United States that examined teachers' strategies for fostering positive peer interactions among infants in ECEC, the authors identified that providers used a variety of scaffolding strategies to support infant peer interactions, such as communicating with infants about one another's feelings, behaviours, and objects, as well as helping an infant to incorporate into a peer group (Williams, Mastergeorge and Ontai, 2010_[155]). Moreover, the findings showed that educators' scaffolding predicted infants' later social competence with peers (Williams, Mastergeorge and Ontai, 2010_[155]). However, the most widely used quality observation systems tend to focus on educator-child relationships without explicitly focusing on teacher-group relationships and interactions (Pastori and et al., 2015_[154]; van Schaik, Leseman and de Haan, 2018_[153]). To address this caveat, authors in the Netherlands have recently developed a process quality measure addressing educators' support of group and peer processes and children's collaborative play. The observational measure covered features such as educators' facilitation of group processes, namely by organising the play setting as a group activity and in a way that they can face each other, as teachers actively support collaboration processes, concretely by directing children's attention to other children's actions, modelling and encouraging children's prosocial behaviours (van Schaik, Leseman and de Haan, 2018_[153]). The findings showed that although educators' support of group processes was positively related with overall levels of process quality, it was uniquely associated with children's collaborative play (van Schaik, Leseman and de Haan, 2018_[153]). Consequently, these findings suggest that ECEC quality assessment can be enriched by adding group-centred indicators of process quality (van Schaik, Leseman and de Haan, 2018_[153]).

5.3. Stability and variation of quality across educators

Another shortcoming that has been levelled at global, group-level quality measures relates to the fact that these may also not adequately capture differences across caregivers within a classroom or playroom. In one study from Canada, in an attempt to overcome main limitations of global quality measures, the authors developed a new observational scale at the educator level, focusing on the quality of cognitive sensitivity, defined as a person's ability to create a cognitively stimulating environment when interacting with a less experienced partner while being attuned to this partner's emotional state (Pauker et al., 2018_[29]). The results showed that different educators within each playroom varied substantially in terms of their interaction styles with children (Pauker et al., 2018_[29]). Furthermore, the vast proportion of variance in cognitive sensitivity scores was explained by differences between educators rather than between playrooms, calling into question the practice of assessing quality of interaction at the playroom level (Pauker et al., 2018_[29]). Similarly, in one study conducted in Norway, findings revealed great variations across practitioners within the same playgroup (Bjørnstad et al., 2019_[119]). Although differences were partly explained by pre-service education, with high-qualified educators scoring higher in quality indicators compared to assistants, it was nevertheless unexpected to find that teachers and assistants within a group were not more similar than teachers and assistants from different groups (Bjørnstad et al., 2019_[119]). These findings further call attention to the within-group variation across practitioners and the need to take them into account when examining process quality.

5.4. Stability and variation of quality across activities

Recent research has highlighted that ECEC educators structure children's time throughout the day around different learning activities and routines, suggesting that the type of activity (e.g. play, meals) can be a cornerstone feature with potential effects on process quality for young children (Cabell et al., 2013^[156]; Fuligni et al., 2012^[157]; Early et al., 2010^[158]). In one study from the Netherlands, the authors found that both emotional and educational process quality (as measured by the CLASS) was highest during creative and educational activities compared to care routines (Slot et al., 2015^[107]). Similarly, in one study from Belgium involving home-based settings, findings showed that the quality of caregiver-child interactions was lower during meals and snack time in comparison to guided activities in infant classroom/playrooms and that free play and meals were lower than guided activities in toddler ones (MeMoQ, 2020^[136]). In one recent study conducted in Portugal in toddler classrooms/playgroups (Guedes et al., 2020^[159]), important variations in the levels of process quality were also found across activities. Specifically, levels of emotional support were higher in play in comparison to early academic activities and meals. It appeared that, during free play, educators developed more sensitive interactions with children, and were more likely to follow children's ideas and interests. Moreover, the levels of cognitive stimulation were also higher in free play than meals. In free play, educators were more likely to engage in back-and-forth exchanges, to ask questions and give feedback that encourages child thinking and reasoning, whereas in meals, educators were more passively interacting with children. Although the study was small-scale, involving only 30 classrooms/playgroups, it nevertheless points to the importance to better understand variations in process quality throughout the daily routines (Guedes et al., 2020^[159]). In addition, the study also highlights the importance of understanding better the role of features such as content, materials, or social grouping and their association with the levels of process quality, aspects that have been overlooked in the literature. It suggests that the quality of the interactions between educators and children vary according to activity features, calling for a more nuanced perspective on process quality and broadening the scope of potential factors affecting it, beyond the most stable, structural features, such as educators' qualifications or child-adult ratios.

5.5. Individual- and group-level process quality

Some studies have looked more closely at the quality of child experiences (Hooper and Hallam, 2017^[149]; Guedes et al., 2020^[159]). Studies from the ECEC literature have highlighted that process quality also refers to experiences at the child level and that group level measures of process quality may misrepresent what the individual child experiences in ECEC (Chien et al., 2010^[160]; Downer et al., 2010^[161]; Williford et al., 2013^[162]). In this view, observing children's engagement can provide valuable information at the child level that is not available in most common process quality assessments. Engagement can be defined as the amount of time children spend interacting with the environment in a developmentally and contextually appropriate manner (Hooper and Hallam, 2017^[149]). The observation of child engagement at the child level can help to understand what children are doing and how they are spending their time, allowing researchers to capture process quality from different angles (Guedes et al., 2020^[159]). In one study conducted in the United States, the authors found that there was a positive relationship between toddlers' group engagement and global quality, although they could be differentiated, further suggesting the usefulness of separately assessing toddlers' engagement (Hooper and Hallam, 2017^[149]). In addition, in the few studies found that examined both child- and group-levels of process quality, modest associations were found between the two levels, pointing to the importance of using multiple measures to understand toddler experiences in

centre-based care (Guedes et al., 2020_[159]). More specifically, group and child level observations captured somewhat different aspects of interaction quality, with some types of activities, such as play, showing aligned levels of quality between group level and child level interactions, and other activities in which there were discrepancies, such as meals (Guedes et al., 2020_[159]). During play, at the group level, educators established a positive and warm climate and at the individual level, children were engaged in positive interactions. In contrast, during meals, at the group level the levels of process quality were lower, but at the individual level, particularly in regard to peers, the interactions were warm and positive. Both levels of quality of interactions seem to capture different, but complementary, aspects of the children's experience.

5.6. Continuity of care, stability and variations across the year(s)

An ongoing discussion pertains to the continuity of care in infant and toddler classrooms/playgroups. Considering the central role of warm and responsive relationships for high-quality provision for children under age 3, several authors have recommended that infants and toddlers remain with the same educator for extended periods of time. It has been argued that if the child and his/her educator stay together over time, the educator's emotional investment in the child may increase, as well as his/her knowledge and understanding about the child, contributing to her/his ability to respond appropriately to a child's unique cues and needs and thereby fostering secure, responsive, and supportive relationships (Ruprecht, Elicker and Choi, 2016_[163]; Sosinsky et al., 2016_[164]). Despite the strong theoretical grounds for recommending continuity of care, the few empirical findings have been mixed. In one study from the United States involving 59 toddler classrooms/playgroups, results showed that toddlers who experience continuity of care for at least nine months were rated as having fewer behaviour problems, but not more social competence (Ruprecht, Elicker and Choi, 2016_[163]). Moreover, observed caregiver interactive involvement, characterised by positive physical proximity and active engagement in conversations with the child, was higher in classrooms/playgroups sustaining continuity of care (Ruprecht, Elicker and Choi, 2016_[163]). However, in a recent study involving a large database in the United States, consistent experience with the same teacher/caregiver over time was associated with educators' report of lower problem behaviours and higher social competence, but not with receptive vocabulary skills (Choi et al., 2019_[57]). In another study following children up to preschool, the findings added to the mixed evidence (Horm et al., 2018_[60]). During the infant-toddler period, children experiencing continuity of care were rated by the infant-toddler educator as showing lower levels of behavioural concerns and higher levels of self-control and initiative. Yet, for preschool entry-level outcomes, the positive associations with continuity of care were no longer statistically significant. Overall, findings did not reliably support positive effects of continuity of care on children's developmental outcomes. It seems that continuity of care is a complex variable that involves many specificities and ways of implementation, requiring more studies to account for different operationalisations.

In addition, it is possible that continuity of care interplay with other classroom features, such as the quality interactions with educators. It may be that continuity of care and interactional quality have cumulative effects on developmental outcomes, such that children experiencing both continuity of care and high-quality interactions show higher levels of developmental outcomes. Indeed, Horm et al. (2018_[60]) found that toddlers who experienced both continuity of care and high-quality interactions were rated as having higher self-control at the preschool entry. But it is also possible that high quality interactions compensate for the negative effects of instability of care. In Choi et al.'s (2019_[57]) study, higher levels of emotional support predicted lower problem behaviours

and higher social competence only for children experiencing instability of care. Clearly, more research is needed to disentangle the complex interplay between continuity of care, process quality and developmental outcomes.

Other studies have looked specifically to the stability of process quality over time within the same group of educators and infants (Pessanha et al., 2017_[145]). In one such study conducted in Portugal, findings showed that the overall levels of process quality decreased over the year (Pessanha et al., 2017_[145]), suggesting that more attention should be paid to understanding how can educators sustain positive and stimulating interactions with infants and toddlers across time.

Concluding remarks

In summary, despite the fact that process quality for under age 3 is a complex, multidimensional, and value-laden concept, there has been an increased agreement on its core features – such as warm, sensitive and responsive interactions, the crucial role of both education and care, and the importance of strong partnerships with parents. Nevertheless, although there are validated, widely-used observational measures that capture these key features, recent studies have called attention to the importance of capturing more fine-grained information on children’s experiences, including peer experiences, child-level interactions, and variations across educators, the day and over the year. Also, although substantial research has covered teachers’ beliefs, acknowledging its importance for conceptualising, understanding and assessing process quality, most studies are small-scaled. Consequently, there is still a lot to be learned on what teachers think about their experiences and practices with children and its links to process quality.

Regarding home-based services, the field’s diversity is noteworthy. Noticeably, there is lack of consistency in terminology and measures used to describe home-based settings, possibly reflecting the variety of the home-based arrangements and the disparity in regulation across and within countries. In addition, while for centre-based services it was possible to look specifically for settings serving children under age 3, for home-based settings where it is common to include mixed-aged groups, results are not exclusive for under age 3. Hence, the specificities in education and care in home-based settings for this particular age group may have been somewhat overlooked. All of these create barriers to building a solid research base. Cross-country studies that use common (or comparable) definitions and measures may be a good avenue to learn more about the quality of these services. Furthermore, even in settings with mixed-aged groups, it would be important to report findings separately for different age groups, clearly differentiating findings for children under age 3.

Regarding preservice training and structural features of quality, the research studies covered by this literature review are in line with previous findings, highlighting the importance of high-qualified teachers (i.e. specialised training in ECEC) and low child-to-teacher ratios for higher levels of process quality. However, some recent trends are of relevance. Recent studies have highlighted the relevance of the (understudied) scope/content and teaching methods of preservice training for process quality, in order to shed light on the best ways to prepare teachers to care for and educate children under age 3. Furthermore, PD seems a promising path to quality improvement, with recent studies highlighting key features such as practice-focused, coaching, and peer networking, although also highlighting the importance of aligning PD components with specific needs and goals. Also, as recent studies have underscored, more attention is needed to consider all staff within a group, both for process quality assessment and improvement.

For the links between structural and process quality, while few isolated structural features seem relevant for process quality, such as ratios and group size, recent studies have called attention to the interplay among them, and the need to better understand their joint effects. In addition, the recent emphasis on playroom/playgroup features, such as the role of peers or activities across the day, may also contribute to a more nuanced view of the structural-process quality division, as these new aspects have not yet been considered in current definitions of both structural and process quality. In conclusion, although in general process quality is positively associated with better outcomes for young children, the literature has moved on to unravel and complexify the concept of quality, exploring ways

of studying quality beyond the traditional measures. Ultimately, this has led to a more nuanced and multifaceted understanding of the concept of quality, allowing for the uncovering of differential effects and a deeper understanding of the challenges and levers to promote it.

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Annex A. Main Search | 2017-2019

Chapter	Topic	Research terms	EBSCO (2017-2019)		Selected results PRELIMINARY
			Number of records	Number of selected records (based on title and abstract)	
Governance and Regulations					
	Home based/ family based	ECEC OR early childhood OR ECCE OR childcare OR child care OR daycare OR day care AND home-based OR home based OR family based OR family child care AND regulated AND under 3 years old OR infants OR toddlers OR birth to three	84	14	<p>Levere, M. et al. (2019), "Approaches to collaboration: Experiences of the Early Head Start-child care partnerships", <i>Early Education and Development</i>, Vol. 30/8, pp. 975-989, https://doi.org/10.1080/10409289.2019.1656319.</p> <p>Linberg, A. et al. (2019), "Quality of toddler childcare – Can it be assessed with questionnaires?", <i>Early Child Development and Care</i>, Vol. 189/8, pp. 1369–1383, https://doi.org/10.1080/03004430.2017.1380636.</p> <p>Sekeráková Búriková, Z. (2019). Paid home-based childcare in Slovakia: Informal markets and care loops. <i>Journal of European Social Policy</i>, Vol. 29/5, pp. 653–665, https://doi.org/10.1177/0958928719873834</p> <p>Eckhardt, A. and F. Egert (2018), "Process quality for children under three years in early child care and family child care in Germany", <i>Early Years</i>, Vol. 40/3, pp. 1-19, https://doi.org/10.1080/09575146.2018.1438373.</p> <p>Sullivan, A. L., E.M. Farnsworth and A. Susman-Stillman (2018). Childcare type and quality among subsidy recipients with and without special needs. <i>Infants & Young Children</i>, Vol. 31/2, pp. 109–127. https://doi.org/10.1097/IYC.0000000000000116.</p> <p>Bernal, R. et al. (2019), "The effects of the transition from home-based childcare to childcare centers on children's health and development in Colombia", <i>Early Childhood Research Quarterly</i>, Vol. 47, pp. 418-431, https://doi.org/10.1016/j.ecresq.2018.08.005.</p>

Chapter	Topic	Research terms	EBSCO (2017-2019)		Selected results PRELIMINARY
			Number of records	Number of selected records (based on title and abstract)	
					<p>Ang, L. and M. Tabu (2018), "Conceptualising home-based child care: A study of home-based settings and practices in Japan and England", <i>International Journal of Early Childhood</i>, Vol. 50/2, pp. 143-158, https://doi.org/10.1007/s13158-018-0218-8. – 4 months and 4 years</p> <p>White, L. et al. (2019), "Risk perception, regulation, and unlicensed child care: Lessons from Ontario, Canada", <i>Journal of Risk Research</i>, Vol. 22/7, pp. 878–896, https://doi.org/10.1080/13669877.2017.1422786.</p> <p>Schaack, D., V. Le and C. Setodji (2017), "Home-Based Child Care Provider Education and specialized training: Associations with caregiving quality and toddler social-emotional and cognitive outcomes", <i>Early Education and Development</i>, Vol. 28/6, pp. 655-668, https://doi.org/10.1080/10409289.2017.1321927.</p> <p>Barnes, J. and E. Melhuish (2017), "Amount and timing of group-based childcare from birth and cognitive development at 51 months: A UK study", <i>International Journal of Behavioral Development</i>, 41(3), Vol. 41/3, pp. 360-370, https://doi.org/10.1177%2F0165025416635756.</p> <p>Broekhuizen, M. et al. (2018), "Child care quality and Dutch 2- and 3-year-olds' socio-emotional outcomes: Does the amount of care matter?", <i>Infant and Child Development</i>, Vol. 27/1, https://doi.org/10.1002/icd.2043.</p> <p>Tervahartiala, K., Karlsson, L., Pelto, J., Kortelnuoma, S., Hyttinen, S., Ahtola, A., ... Karlsson, H. (2019). "Toddlers' diurnal cortisol levels affected by out-of-home, center-based childcare and at-home, guardian-supervised childcare: Comparison between different caregiving contexts", <i>European Child & Adolescent Psychiatry</i>, https://doi.org/10.1007/s00787-019-01432-3.</p> <p>Observed non-compliance with safe sleeping guidelines in licensed home- and centre- based childcare services. (2018), <i>Journal of Sleep Research</i>, Vol. 27, p. 1, https://doi.org/10.1111/jsr.37_12765.</p> <p>Neshteruk, C. D., S. Mazzucca, T. Østbye and D. Ward (2018), "The physical environment in family childcare homes and children's physical activity", <i>Child: Care, Health & Development</i>, Vol. 44/5, pp. 746–752, https://doi.org/10.1111/cch.12578.</p>

Workforce	Staff qualification	ECEC OR early childhood OR ECCE OR childcare OR child care OR daycare OR day care AND caregiver training OR qualification OR teacher qualification AND birth to three OR children under 3 years old OR infants OR toddlers	42	11	<p>Lim, C. (2019), "Singaporean educators' reflections about their role and practices in the education and care of infants". <i>Journal of Early Childhood Teacher Education</i>, 40(2), 74–95. https://doi.org/10.1080/10901027.2018.1519518.</p> <p>Katsiada, E. et al. (2018), "Young children's agency: Exploring children's interactions with practitioners and ancillary staff members in Greek early childhood education and care settings", <i>Early Child Development and Care</i>, Vol. 188/7, pp. 937-950, https://doi.org/10.1080/03004430.2018.1446429.</p> <p>Degotardi, S., F. Han and J. Torr (2018), "Infants' experience with 'near and clear' educator talk: Individual variation and its relationship to indicators", <i>International Journal of Early Years Education</i>, Vol. 26/3, pp. 278-294, https://doi.org/10.1080/09669760.2018.1479632.</p> <p>Barros, S. et al. (2018), "The quality of caregiver–child interactions in infant classrooms in Portugal: The role of caregiver education", <i>Research Papers in Education</i>, Vol. 33/4, pp. 427-451, https://doi.org/10.1080/02671522.2017.1353676.</p> <p>Eckhardt, A. and F. Egert (2018), "Process quality for children under three years in early child care and family child care in Germany", <i>Early Years</i>, Vol. 40/3, pp. 1-19, http://dx.doi.org/10.1080/09575146.2018.1438373.</p> <p>Degotardi, S., J. Torr and F. Han (2018), "Infant educators' use of pedagogical questioning: relationships with the context of interaction and educators' qualifications", <i>Early Education and Development</i>, Vol. 29/8, pp. 1004-1018, https://doi.org/10.1080/10409289.2018.1499000.</p> <p>Loizou, E. and S. Recchia (2018), "In-service infant teachers re-envision their practice through a professional development program", <i>Early Education and Development</i>, Vol. 29/1, pp. 91-103, https://doi.org/10.1080/10409289.2017.1343561.</p> <p>Schaack, D., V. Le and C. Setodji (2017), "Home-based child care provider education and specialized training: Associations with caregiving quality and toddler social-emotional and cognitive outcomes", <i>Early Education and Development</i>, Vol. 28/6, pp. 655-668, https://doi.org/10.1080/10409289.2017.1321927.</p> <p>Hu, J. et al. (2019), "Educators' use of commanding language to direct infants' behaviour: relationship to educators' qualifications and implications for language learning opportunities", <i>Early Years</i>, Vol. 39/2, pp. 190-204, https://doi.org/10.1080/09575146.2017.1368008.</p> <p>Manning, M. et al. (2019), "Is teacher qualification associated with the quality of the early childhood education and care environment? A meta-analytic review", <i>Review of Educational Research</i>, Vol. 89/3, pp. 370-415, https://doi.org/10.3102/0034654319837540.</p>
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Chapter	Topic	Research terms	EBSCO (2017-2019)		Selected results PRELIMINARY
			Number of records	Number of selected records (based on title and abstract)	
					Ansari, A., and R.C. Pianta (2019), "Teacher-child interaction quality as a function of classroom age diversity and teachers' beliefs and qualifications", <i>Applied Developmental Science</i> , Vol. 23/3, pp. 294-304, https://doi.org/10.1080/10888691.2018.1439749 .
		ECEC OR early childhood OR ECCE OR childcare OR child care OR daycare OR day care AND Teacher experience OR caregiver experience AND birth to three OR children under 3 years old OR infants OR toddlers	68	(Not screened)	
		ECEC OR early childhood OR ECCE OR childcare OR child care OR daycare OR day care AND teacher pre-service training OR caregiver pre-service training AND birth to three OR children under 3 years old OR infants OR toddlers	2	2	Recchia, S. L., M. Shin, and C. Snaider (2018), "Where is the love? Developing loving relationships as an essential component of professional infant care", <i>International Journal of Early Years Education</i> , Vol. 26/2, pp. 142-158, https://doi.org/10.1080/09669760.2018.1461614 . Hu, J., S. Degotardi, J. Torr and F. Han (2019). "Reasoning as a pedagogical strategy in infant-addressed talk in early childhood education centres: relationships with educators' qualifications and communicative function", <i>Early Education & Development</i> , Vol. 30/7, pp. 872-886, https://doi.org/10.1080/10409289.2019.1607449 .

Chapter	Topic	Research terms	EBSCO (2017-2019)		Selected results PRELIMINARY
			Number of records	Number of selected records (based on title and abstract)	
		ECEC OR early childhood OR ECCE OR childcare OR child care OR daycare OR day care AND professional development OR in-service OR Continuing education AND toddlers OR Infants or under three years old OR birth to three	293	6 (not all screened)	<p>Barros, S. et al. (2018), "The quality of caregiver–child interactions in infant classrooms in Portugal: The role of caregiver education", <i>Research Papers in Education</i>, Vol. 33/4, pp. 427-451, . https://doi.org/10.1080/02671522.2017.1353676.</p> <p>Vázquez, M. M. M., and A.G. García. (2019), "Community Programme to address the needs of the population aged 0-18 in situations of poverty and social exclusion in Bilbao: Caixa ProInfancia Programme", <i>International Journal of Integrated Care (IJIC)</i>, Vol. 19/S1, pp. 1–2. https://doi.org/10.5334/ijic.s3603.</p> <p>Chen, J., A. Martin and V. Erdosi-Mehaffey (2017), "The Process and Impact of the Infant/toddler credential as professional development: Reflections from multiple perspectives and recommendations for policy", <i>Early Childhood Education Journal</i>, Vol. 45, pp. 359-368, https://doi.org/10.1007/s10643-015-0767-5.</p> <p>Donegan-Ritter, M. and B. Van Meeteren (2018), "Using practice-based coaching to increase use of language facilitation strategies in early head start and community partners", <i>Infants & Young Children: An Interdisciplinary Journal of Early Childhood Intervention</i>, Vol. 31/3, pp. 215–230, http://dx.doi.org/10.1097/IYC.000000000000122.</p> <p>Loizou, E. and S. Recchia (2018), "In-service infant teachers re-envision their practice through a professional development program", <i>Early Education and Development</i>, Vol. 29/1, pp. 91-103, https://doi.org/10.1080/10409289.2017.1343561.</p> <p>Ackerman, D. (2017), "Online child care training in the United States: a preliminary investigation of who participates, what is offered, and on which topics the workforce is focusing", <i>International Journal of Child Care and Education Policy</i>, Vol. 11/1, pp. 1–22. https://doi.org/10.1186/s40723-017-0037-7.</p>
	Working conditions	ECEC OR early childhood OR ECCE OR childcare OR child care OR daycare OR day care AND work* conditions OR teacher salary AND under 3 years old OR infants OR toddlers OR birth to three	12	3	<p>Cassidy, D. et al. (2017), "Teacher work environments are toddler learning environments: teacher professional well-being, classroom emotional support, and toddlers' emotional expressions and behaviours", <i>Early Child Development and Care</i>, Vol. 187/1, pp. 1666–1678, https://doi.org/10.1080/03004430.2016.1180516.</p> <p>Mimura, Y., Y. Cai, H. Tonyan and J. Koonce (2019), "Resource well-being among family child care business owners", <i>Journal of Family and Economic Issues</i>, Vol. 40/3, pp. 408–422, https://doi.org/10.1007/s10834-019-09620-8.</p> <p>Chan, W. (2019), "Challenges to the infant care profession: Practitioners' perspectives", <i>Early Child Development and Care</i>, Vol. 189/12, pp. 2043–2055, https://doi.org/10.1080/03004430.2018.1432606.</p>

Chapter	Topic	Research terms	EBSCO (2017-2019)		Selected results PRELIMINARY
			Number of records	Number of selected records (based on title and abstract)	
		ECEC OR early childhood OR ECCE OR childcare OR child care OR daycare OR day care AND professional development AND birth to three OR children under 3 years old OR infants OR toddlers	42	6	<p>Levere, M. et al. (2019), "Approaches to collaboration: Experiences of the Early Head Start-child care partnerships", <i>Early Education and Development</i>, Vol. 30/8, pp. 975-989, https://doi.org/10.1080/10409289.2019.1656319.</p> <p>Norris, D. (2017), "Comparing language and literacy environments in two types of infant-toddler child care centers", <i>Early Childhood Education Journal</i>, Vol. 45/1, pp. 95-101, https://doi.org/10.1007/s10643-014-0679-9.</p> <p>Chen, J., A. Martin and V. Erdosi-Mehaffey (2017), "The Process and Impact of the Infant/toddler credential as professional development: Reflections from multiple perspectives and recommendations for policy", <i>Early Childhood Education Journal</i>, Vol. 45, pp. 359-368, https://doi.org/10.1007/s10643-015-0767-5</p> <p>Moran, M. et al. (2017), "Learning from each other: The design and implementation of a cross-cultural research and professional development model in Italian and U.S. toddler classrooms", <i>Teaching and Teacher Education</i>, Vol. 63, pp. 1-11, https://doi.org/10.1016/j.tate.2016.10.018.</p> <p>Donegan-Ritter, M. and B. Van Meeteren (2018), "Using practice-based coaching to increase use of language facilitation strategies in early head start and community partners", <i>Infants & Young Children: An Interdisciplinary Journal of Early Childhood Intervention</i>, Vol. 31/3, pp. 215–230, http://dx.doi.org/10.1097/IYC.000000000000122.</p> <p>Helmerhorst, K. et al. (2017), "Improving quality of the child care environment through a consultancy programme for centre directors", <i>International Journal of Early Years Education</i>, Vol. 25/4, pp. 361–378, https://doi.org/10.1080/09669760.2017.1321528.</p>

Chapter	Topic	Research terms	EBSCO (2017-2019)		Selected results PRELIMINARY
			Number of records	Number of selected records (based on title and abstract)	
Settings	Structural features	ECEC OR early childhood OR ECCE OR childcare OR child care OR daycare OR day care AND Structural features OR structural dimensions OR Structural characteristics AND children under 3 years old OR toddlers OR Infants OR birth to three	12	8	<p>Bjørnstad, E. and E. Os (2018), "Quality in Norwegian childcare for toddlers using ITERS-R", <i>European Early Childhood Education Research Journal</i>, Vol. 26/1, pp. 111-127, https://doi.org/10.1080/1350293X.2018.1412051.</p> <p>Ang, L. and M. Tabu (2018), "Conceptualising home-based child care: A study of home-based settings and practices in Japan and England", <i>International Journal of Early Childhood</i>, Vol. 50/2, pp. 143-158, https://doi.org/10.1007/s13158-018-0218-8</p> <p>Pessanha, M. et al. (2017), "Stability and change in teacher-infant interaction quality over time", <i>Early Childhood Research Quarterly</i>, Vol. 40, pp. 87-97, https://doi.org/10.1016/j.ecresq.2016.10.003.</p> <p>Helmerhorst, K., C. Colonnesi and R. Fukink (2019), "Caregiver's mind-mindedness in early center-based childcare", <i>Early Education and Development</i>, Vol. 30/7, pp. 854-871, https://doi.org/10.1080/10409289.2019.1593076</p> <p>Eckhardt, A. and F. Egert (2018), "Differences in childcare quality—A matter of personality traits, socialization goals and pre-service curriculum?", <i>Early Child Development and Care</i>, Vol. 188/12, pp. 1726-1737, https://doi.org/10.1080/03004430.2016.1278372</p> <p>Hooper, A. (2019), "Classifying home-based child care providers: Validating a typology of providers' beliefs and self-reported practices", <i>Early Childhood Education Journal</i>, Vol. 47/3, pp. 275-285, https://doi.org/10.1007/s10643-019-00926-8.</p> <p>Eckhardt, A. and F. Egert (2018), "Process quality for children under three years in early child care and family child care in Germany", <i>Early Years</i>, Vol. 40/3, pp. 1-19, http://dx.doi.org/10.1080/09575146.2018.1438373.</p> <p>Cohen, F., and Y. Anders (2019), "Family involvement in early childhood education and care and its effects on the social-emotional and language skills of 3-year-old children", <i>School Effectiveness and School Improvement</i>. https://doi.org/10.1080/09243453.2019.1646293.</p>

Chapter	Topic	Research terms	EBSCO (2017-2019)		Selected results PRELIMINARY
			Number of records	Number of selected records (based on title and abstract)	
	Monitoring	ECEC OR early childhood OR ECCE OR childcare OR child care OR daycare OR day care AND monitoring quality AND under 3 years old OR infants OR toddlers OR birth to three	7	2	Halle, T. et al. (2019), "Implementation Lessons from Six Early Head Start - Child Care Partnerships", <i>Early Education & Development</i> , Vol. 30/8, pp. 990-1008, https://doi.org/10.1080/10409289.2019.1656320 . Lopez Boo, F., M. Dormal and A. Weber (2019), "Validity of four measures of child care quality in a national sample of centers in Ecuador", <i>PLoS ONE</i> , Vol. 14/2, https://doi.org/10.1371/journal.pone.0209987
	Location	ECEC OR early childhood OR ECCE OR childcare OR child care OR daycare OR day care AND location OR region AND children under 3 years old OR toddlers OR Infants OR birth to three	1	0	
		childcare services OR child care OR daycare OR day care AND rural OR urban AND children under 3 years old OR toddlers OR Infants OR birth to three	0	0	
	Broader features	ECEC OR early childhood OR Child* services AND teachers AND children under 3 years old OR toddlers OR Infants OR birth to three	66	4	Bjørnstad, E. and E. Os (2018), "Quality in Norwegian childcare for toddlers using ITERS-R", <i>European Early Childhood Education Research Journal</i> , Vol. 26/1, pp. 111-127, https://doi.org/10.1080/1350293X.2018.1412051 . Linberg, A. et al. (2019), "Quality of toddler childcare – Can it be assessed with questionnaires?", <i>Early Child Development and Care</i> , Vol. 189/8, pp. 1369–1383, https://doi.org/10.1080/03004430.2017.1380636 Kleppe, R. (2018), "Affordances for 1- to 3-year-olds' risky play in early childhood education and care", <i>Journal of Early Childhood Research</i> , Vol. 16/3, pp. 258–275., https://doi.org/10.1177/1476718X18762237 . Ang, L., E. Brooker and C. Stephen (2017), "A review of the research on childminding: Understanding children's experiences in home-based childcare settings", <i>Early Childhood Education Journal</i> , Vol. 45, pp. 261–270, https://doi.org/10.1007/s10643-016-0773-2 .

Chapter	Topic	Research terms	EBSCO (2017-2019)		Selected results PRELIMINARY
			Number of records	Number of selected records (based on title and abstract)	
	Center	ECEC OR early childhood OR ECCE OR childcare OR child care OR daycare OR day care AND center characteristics AND children under 3 years old OR toddlers OR Infants OR birth to three	26	5	<p>Linberg, A. et al. (2019), "Quality of toddler childcare – Can it be assessed with questionnaires?", <i>Early Child Development and Care</i>, Vol. 189/8, pp. 1369–1383, https://doi.org/10.1080/03004430.2017.1380636</p> <p>Norris, D. (2017), "Comparing language and literacy environments in two types of infant-toddler child care centers", <i>Early Childhood Education Journal</i>, Vol. 45/1, pp. 95-101, https://doi.org/10.1007/s10643-014-0679-9.</p> <p>Mortensen, J. and M. Barnett (2018), "Emotion regulation, harsh parenting, and teacher sensitivity among socioeconomically disadvantaged toddlers in child care", <i>Early Education and Development</i>, Vol. 29/2, pp. 143-160, https://doi.org/10.1080/10409289.2017.1371560.</p> <p>Pessanha, M. et al. (2017), "Stability and change in teacher-infant interaction quality over time", <i>Early Childhood Research Quarterly</i>, Vol. 40, pp. 87-97, https://doi.org/10.1016/j.ecresq.2016.10.003.</p> <p>Zhang, Z. et al. (2018), "Environmental characteristics of early childhood education and care, daily movement behaviours and adiposity in toddlers: A multilevel mediation analysis from the GET UP! Study", <i>Health & Place</i>, Vol. 54, pp. 236–243, https://doi.org/10.1016/j.healthplace.2018.10.008.</p>
	Space	ECEC OR early childhood OR ECCE OR childcare OR child care OR daycare OR day care OR programs AND space OR classroom arrangement OR classroom area AND children under 3 years old OR toddlers OR Infants OR birth to three	13	5	<p>Sumsion, J., Harrison, L. J., and Stapleton, M. (2018), "Spatial perspectives on babies' ways of belonging in infant early childhood education and care", <i>Journal of Pedagogy</i>, Vol. 9/1, pp. 109–131. https://doi.org/10.2478/jped-2018-0006.</p> <p>van Liempd, H. (Ine) M. J. A., O. Oudgenoeg-Paz., R.G. Fukkink and P.P.M. Leseman (2018), "Young children's exploration of the indoor playroom space in center-based childcare", <i>Early Childhood Research Quarterly</i>, Vol. 43, pp. 33–41. https://doi.org/10.1016/j.ecresq.2017.11.005.</p> <p>Shin, M. and T. Partyka (2017), "Empowering infants through responsive and intentional play activities", <i>International Journal of Early Years Education</i>, Vol. 25/2, pp. 127–142, https://doi.org/10.1080/09669760.2017.1291331.</p> <p>Loizou, E. and S. Recchia (2018), "In-service infant teachers re-envision their practice through a professional development program", <i>Early Education and Development</i>, Vol. 29/1, pp. 91-103, https://doi.org/10.1080/10409289.2017.1343561.</p>

Chapter	Topic	Research terms	EBSCO (2017-2019)		Selected results PRELIMINARY
			Number of records	Number of selected records (based on title and abstract)	
					Müller, A. B., N.C. Valentini and P.F.R. Bandeira (2017), "Affordances in the home environment for motor development: Validity and reliability for the use in daycare setting", <i>Infant Behavior and Development</i> , Vol. 47, pp. 138–145. https://doi.org/10.1016/j.infbeh.2017.03.008 .
	Group size/ratio Ratio	ECEC OR early childhood OR ECCE OR childcare OR child care OR daycare OR day care OR programs AND group size AND children under 3 years old OR toddlers OR Infants OR birth to three	5	3	<p>Degotardi, S., F. Han, and J. Torr (2018). Infants' experience with 'near and clear' educator talk: individual variation and its relationship to indicators of quality, <i>International Journal of Early Years Education</i>, Vol. 26/3, 278–294, https://doi.org/10.1080/09669760.2018.1479632.</p> <p>Lopez Boo, F., M. Dormal and A. Weber (2019), "Validity of four measures of child care quality in a national sample of centers in Ecuador", <i>PLoS ONE</i>, Vol. 14/2, https://doi.org/10.1371/journal.pone.0209987</p> <p>Neshteruk, C. D. et al.. (2018), "The physical environment in family childcare homes and children's physical activity", <i>Child: Care, Health and Development</i>, Vol. 44/5, pp. 746–752, https://doi.org/10.1111/cch.12578.</p>
		ECEC OR early childhood OR ECCE OR childcare OR child care OR daycare OR day care AND ratio AND children under 3 years old OR toddlers OR Infants OR birth to three	20	9	<p>Degotardi, S., F. Han, and J. Torr (2018). Infants' experience with 'near and clear' educator talk: individual variation and its relationship to indicators of quality, <i>International Journal of Early Years Education</i>, Vol. 26/3, 278–294, https://doi.org/10.1080/09669760.2018.1479632</p> <p>Linberg, A. et al. (2019), "Quality of toddler childcare – Can it be assessed with questionnaires?", <i>Early Child Development and Care</i>, Vol. 189/8, pp. 1369–1383, https://doi.org/10.1080/03004430.2017.1380636</p> <p>Bjørnstad, E. and E. Os (2018), "Quality in Norwegian childcare for toddlers using ITERS-R", <i>European Early Childhood Education Research Journal</i>, Vol. 26/1, pp. 111-127, https://doi.org/10.1080/1350293X.2018.1412051.</p> <p>Soderstrom, M. et al. (2018), "Influences of number of adults and adult: child ratios on the quantity of adult language input across childcare settings", <i>First Language</i>, Vol. 38/6, pp. 563–581, https://doi.org/10.1177%2F0142723718785013</p> <p>Pessanha, M. et al. (2017), "Stability and change in teacher-infant interaction quality over time", <i>Early Childhood Research Quarterly</i>, Vol. 40, pp. 87-97, https://doi.org/10.1016/j.ecresq.2016.10.003.</p> <p>Løkken, I. et al. (2018), "The relationship between structural factors and interaction quality in Norwegian ECEC for toddlers", <i>International Journal of Child Care and Education Policy</i>, Vol. 12, https://doi.org/10.1186/s40723-018-0048-z.</p>

Chapter	Topic	Research terms	EBSCO (2017-2019)		Selected results PRELIMINARY
			Number of records	Number of selected records (based on title and abstract)	
					<p>Lopez Boo, F., M. Dormal and A. Weber (2019), "Validity of four measures of child care quality in a national sample of centers in Ecuador", <i>PLoS ONE</i>, Vol. 14/2, https://doi.org/10.1371/journal.pone.0209987</p> <p>Hu, B. et al. (2019), "Global quality profiles in Chinese early care classrooms: Evidence from the Shandong Province", <i>Children and Youth Services Review</i>, Vol. 101, pp. 157-164, http://dx.doi.org/10.1016/j.childyouth.2019.03.056.</p>
Process quality	Effects of quality	ECEC OR early childhood quality OR ECCE quality OR childcare quality OR child care quality OR daycare quality OR day care quality AND child development OR adjustment OR outcomes AND children under 3 years old OR infants OR toddlers OR birth to three	65	21 (not all screened)	<p>Bossi, T., S. Brites and C. Piccinini (2017), "Adjustment of babies to daycare: Aspects that facilitate adjustment or not", <i>Paideia</i>, Vol. 27, Suppl. 1, pp. 448-456, https://doi.org/10.1590/1982-432727s1201710.</p> <p>Araujo, M., M. Dormal and N. Schady (2019), "Childcare quality and child development", <i>Journal of Human Resources</i>, Vol. 54/3, pp. 656-682, https://doi.org/10.3368/jhr.54.3.0217.8572R1.</p> <p>Zhang, X. and W. Chan (2019), "Effectiveness of the SIME program for infants and toddlers in center-based settings", <i>Research on Social Work Practice</i>, Vol. 29/6, pp. 644-662, https://doi.org/10.1177%2F1049731518775218.</p> <p>Linberg, A. et al. (2019), "Quality of toddler childcare – Can it be assessed with questionnaires?", <i>Early Child Development and Care</i>, Vol. 189/8, pp. 1369-1383, https://doi.org/10.1080/03004430.2017.1380636</p> <p>Pinto, A. et al. (2019), "Quality of infant child care and early infant development in Portuguese childcare centers", <i>Early Childhood Research Quarterly</i>, Vol. 48, pp. 246-255. https://doi.org/10.1016/j.ecresq.2019.04.003.</p> <p>Mortensen, J. and M. Barnett (2018), "Emotion regulation, harsh parenting, and teacher sensitivity among socioeconomically disadvantaged toddlers in child care", <i>Early Education and Development</i>, Vol. 29/2, pp. 143-160, https://doi.org/10.1080/10409289.2017.1371560.</p> <p>Leirbakk, M. J., Magnus, J. H., Torper, J., and P. Zeanah (2019), "Look to Norway: Serving new families and infants in a multiethnic population", <i>Infant Mental Health Journal</i>, Vol. 40/5, pp. 659-672, https://doi.org/10.1002/imhj.21804.</p> <p>Dearing, E. et al. (2018), "Estimating the consequences of Norway's national scale-up of early childhood education and care (beginning in infancy) for early language skills", <i>Aera Open</i>, Vol. 4/1, https://doi.org/10.1177/2332858418756598.</p>

Chapter	Topic	Research terms	EBSCO (2017-2019)		Selected results PRELIMINARY
			Number of records	Number of selected records (based on title and abstract)	
					<p>Torr, J. (2019), "Infants' experiences of shared reading with their educators in early childhood education and care centres: An observational study", <i>Early Childhood Education Journal</i>, Vol. 47, pp. 519–529, https://doi.org/10.1007/s10643-019-00948-2.</p> <p>Choi, J. et al. (2019), "Do stability of care and teacher-child interaction quality predict child outcomes in Early Head Start?", <i>Early Education and Development</i>, Vol. 30/3, pp. 337-356, https://doi.org/10.1080/10409289.2018.1546096</p> <p>Eliassen, E., H. Zachrisson and E. Melhuish (2018), "Is cognitive development at three years of age associated with ECEC quality in Norway?", <i>European Early Childhood Education Research Journal</i>, 26(1), Vol. 26/1, pp. 97-110, https://doi.org/10.1080/1350293X.2018.1412050.</p> <p>Helmerhorst, K. et al. (2017), "Effects of the caregiver interaction profile training on caregiver-child interactions in Dutch child care centers: A randomized controlled trial", <i>Child Youth Care Forum</i>, Vol. 46/3, pp. 413-436, https://doi.org/10.1007/s10566-016-9383-9 (0-4 years)</p> <p>Hooper, A. and R. Hallam (2017), "Exploring the relationship between global quality and group engagement in toddler child care classrooms", <i>Journal of Research in Childhood Education</i>, Vol. 31/2, pp. 215–226, https://doi.org/10.1080/02568543.2016.1273287.</p> <p>Sumsion, J., L. Harrison and B. Bradley (2018), "Building a knowledge base about the impact of early learning frameworks for infants and toddlers", <i>Early Child Development and Care</i>, Vol. 188/6, pp. 651–664, https://doi.org/10.1080/03004430.2016.1226294.</p> <p>Gardner-Neblett, N., et al. (2017), "Books and toddlers in child care: Under what conditions are children most engaged?", <i>Child & Youth Care Forum</i>, Vol. 46/4, pp. 473–493, https://doi.org/10.1007/s10566-017-9391-4.</p> <p>Son, S. C., and Y. E. Chang (2018), "Childcare experiences and early school outcomes: The mediating role of executive functions and emotionality" <i>Infant and Child Development</i>, Vol. 27/4, p. 1. https://doi.org/10.1002/icd.2087</p>

Chapter	Topic	Research terms	EBSCO (2017-2019)		Selected results PRELIMINARY
			Number of records	Number of selected records (based on title and abstract)	
					<p>Klette, T., M. B Drugli, and A. M. Aandahl. (2018), "Together and alone a study of interactions between toddlers and childcare providers during mealtime in Norwegian childcare centres", <i>Early Child Development and Care</i>, Vol. 188/3, pp. 387-398, https://doi.org/10.1080/03004430.2016.1220943.</p> <p>Seiler, C. W., E. Müller, and H. Simoni (2017), "The protective role of childcare quality for behavioral adjustment in 3- to 5-year-old children", <i>Zeitschrift Für Entwicklungspsychologie Und Pädagogische Psychologie</i>, Vol. 49/1, pp. 1–10, https://doi.org/10.1026/0049-8637/a000162.</p> <p>Broekhuizen, M. et al. (2018), "Child care quality and Dutch 2- and 3-year-olds' socio-emotional outcomes: Does the amount of care matter?", <i>Infant and Child Development</i>, Vol. 27/1, https://doi.org/10.1002/icd.2043.</p> <p>Smith, H. C., et al (2018), "Caregivers and service providers' perspectives on a western australian aboriginal community's 0-3 years, early learning programme", <i>Early Child Development and Care</i>, Vol. 188/10, pp. 1431-1441 https://doi.org/10.1080/03004430.2016.1263946.</p> <p>Nores, M., R. Bernal, and, W. S. Barnett, (2019), "Center-Based Care for Infants and Toddlers: The AeioTU Randomized trial", <i>Economics of Education Review</i>, Vol. 72, pp. 30–43. https://doi.org/10.1016/j.econedurev.2019.05.004.</p> <p>Perlman, Brunsek, et al. (2017), "Instrument development and validation of the infant and toddler assessment for quality improvement". <i>Early Education & Development</i>, Vol. 28/1, pp. 115–133, https://doi.org/10.1080/10409289.2016.1186468.</p>
Process quality	Domains Variation and Continuity across educators, day and year	ECEC OR early childhood OR ECCE OR childcare OR child care OR daycare OR day care AND Process quality OR Teacher sensitivity AND children under 3 years old OR toddlers OR Infants OR birth to three	4	3	<p>Mortensen, J. A., and Barnett, M. A. (2019), "Intrusive parenting, teacher sensitivity, and negative emotionality on the development of emotion regulation in Early Head Start toddlers", <i>Infant Behavior & Development</i>, Vol. 55, pp. 10–21, https://doi.org/10.1016/j.infbeh.2019.01.004.</p> <p>Eckhardt, A. and F. Egert (2018), "Process quality for children under three years in early child care and family child care in Germany", <i>Early Years</i>, Vol. 40/3, pp. 1-19, http://dx.doi.org/10.1080/09575146.2018.1438373.</p> <p>Pauker, S. et al. (2018), "Caregiver cognitive sensitivity: Measure development and validation in Early Childhood Education and Care (ECEC) settings", <i>Early Childhood Research Quarterly</i>, Vol. 45, pp. 45-57, https://doi.org/10.1016/j.ecresq.2018.05.001.</p>

Chapter	Topic	Research terms	EBSCO (2017-2019)		Selected results PRELIMINARY
			Number of records	Number of selected records (based on title and abstract)	
		ECEC OR early childhood OR ECCE OR childcare OR child care OR daycare OR day care AND teacher interaction AND infants OR toddlers OR children under 3 years old OR birth to three	29	8	<p>Pinto, A. et al. (2019), "Quality of infant child care and early infant development in Portuguese childcare centers", <i>Early Childhood Research Quarterly</i>, pp. 246-255, https://doi.org/10.1016/j.ecresq.2019.04.003.</p> <p>Choi, J. et al. (2019), "Do stability of care and teacher-child interaction quality predict child outcomes in Early Head Start?", <i>Early Education and Development</i>, Vol. 30/3, pp. 337-356, https://doi.org/10.1080/10409289.2018.1546096</p> <p>Degotardi, S., F. Han, and J. Torr, (2018). "Infants' experience with 'near and clear' educator talk: individual variation and its relationship to indicators of quality. <i>International Journal of Early Years Education</i>, Vol. 26/3, pp. 278–294. https://doi.org/10.1080/09669760.2018.1479632</p> <p>Pessanha, M. et al. (2017), "Stability and change in teacher-infant interaction quality over time", <i>Early Childhood Research Quarterly</i>, Vol. 40, pp. 87-97, https://doi.org/10.1016/j.ecresq.2016.10.003.</p> <p>Gardner-Neblett, N., et al.. (2017). Books and toddlers in child care: Under what conditions are children most engaged?", <i>Child & Youth Care Forum</i>, Vol. 46/4, pp. 473–493. https://doi.org/10.1007/s10566-017-9391-4.</p> <p>Redder, B. and E. White (2017), "Implicating teachers in infant–peer relationships: Teacher answerability through alteric acts", <i>Contemporary Issues in Early Childhood</i>, Vol. 18/4, pp. 422–433, https://doi.org/10.1177%2F1463949117742782.</p> <p>Kwon, K. et al. (2019), "The role of teachers' depressive symptoms in classroom quality and child developmental outcomes in Early Head Start programs", <i>Learning and Individual Differences</i>, p. 74, https://doi.org/10.1016/j.lindif.2019.06.002.</p> <p>Barros, S. et al. (2018), "The quality of caregiver–child interactions in infant classrooms in Portugal: The role of caregiver education", <i>Research Papers in Education</i>, Vol. 33/4, pp. 427-451, https://doi.org/10.1080/02671522.2017.1353676.</p>
		ECEC OR early childhood OR ECCE OR childcare OR child care OR daycare OR day care AND continuity OR turnover OR Stability AND children under 3 years	194	9 (not all screened)	<p>Horn, D. et al. (2018), "Associations between continuity of care in infant-toddler classrooms and child outcomes", <i>Early Childhood Research Quarterly</i>, Vol. 42, pp. 105-118, https://doi.org/10.1016/j.ecresq.2017.08.002.</p> <p>Boss, L., and T.T.G. Galuski, ed. (2018), "Continuity of Care, Getting Started with Infants and Toddlers", <i>Exchange</i> (19460406), (239), pp. 60–64.</p>

Chapter	Topic	Research terms	EBSCO (2017-2019)		Selected results PRELIMINARY
			Number of records	Number of selected records (based on title and abstract)	
		old OR birth to three OR infants OR Toddlers OR birth to three			<p>McMullen, M. B. (2017), "Continuity of Care with Infants and Toddlers", <i>Exchange</i> (19460406), (233), pp. 46–50.</p> <p>McMullen, M. B. (2018), "The Many Benefits of Continuity of Care for Infants, Toddlers, Families, and Caregiving Staff", <i>YC: Young Children</i>, Vol. 73/3, pp. 38–39, https://www.jstor.org/stable/e26788970</p> <p>Pessanha, M. et al. (2017), "Stability and change in teacher-infant interaction quality over time", <i>Early Childhood Research Quarterly</i>, Vol. 40, pp. 87-97, https://doi.org/10.1016/j.ecresq.2016.10.003</p> <p>Choi, J. Y., Horm, D., and S. Jeon (2018), "Descriptive study of continuity of care practice and children's experience of stability of care in Early Head Start", <i>Child & Youth Care Forum</i>, Vol. 47/5, pp. 659–681, https://doi.org/10.1007/s10566-018-9450-5.</p> <p>Honig, A. S., and D. S. Wittmer (2017), "Infants and Toddlers: What Have We Learned from Research on Social-emotional Development?", <i>Exchange</i> (19460406), (233), 51–56.</p> <p>Baumgartner, J. et al. (2017), "How much do they need to be the same? What parents believe about continuity between home and childcare environments", <i>Early Child Development and Care</i>, Vol. 187/7, pp. 1184-1193, http://dx.doi.org/10.1080/03004430.2016.1160387.</p> <p>Mc Grath-Lone, L., et al.. (2017), "Factors associated with re-entry to out-of-home care among children in England", <i>Child Abuse & Neglect</i>, Vol. 63, pp. 73–83, https://doi.org/10.1016/j.chiabu.2016.11.012</p>

Chapter	Topic	Research terms	EBSCO (2017-2019)		Selected results PRELIMINARY
			Number of records	Number of selected records (based on title and abstract)	
	Peer relations	ECEC OR early childhood OR ECCE OR childcare OR child care OR daycare OR day care AND Peer relations OR interaction with peers AND children under 3 years old OR birth to three OR infants OR Toddlers OR birth to three	11	4	<p>Shohet, C., Shay, M., C. Almog-Greenberg, ., and E. Adi-Japha (2019), "Early friendships: does a friend's presence in daycare promote toddlers' prosocial behavior toward peers?" <i>Journal of Experimental Education</i>, Vol. 87/3, pp. 517–529, https://doi.org/10.1080/00220973.2018.1496062.</p> <p>Redder, B. and E. White (2017), "Implicating teachers in infant–peer relationships: Teacher answerability through alteric acts", <i>Contemporary Issues in Early Childhood</i>, Vol. 18/4, pp. 422–433, https://doi.org/10.1177%2F1463949117742782.</p> <p>Hay, D. F., et al.. (2017), "If you go down to the woods today: Infants' distress during a teddy bear's picnic in relation to peer relations and later emotional problems", <i>Infancy</i>, Vol. 22/4, pp. 552–570, https://doi.org/10.1111/inf.12172</p> <p>O'Flaherty, C. et al. (2019), "Coaching teachers to promote social interactions with toddlers", <i>Journal of Positive Behavior Interventions</i>, Vol. 21/4, pp. 199-212, https://doi.org/10.1177%2F1098300719851794.</p>
	Dosage	ECEC OR early childhood OR ECCE OR childcare OR child care OR daycare OR day care AND hours in AND children under 3 years old OR birth to three OR infants OR Toddlers OR birth to three	29	7	<p>Wise, S. (2018), "Usage and quality of formal child care services experienced by infants and toddlers in foster and kinship care: An Australian study", <i>International Journal of Early Childhood</i>, Vol. 50/1, pp. 47–65, Usage and quality of formal child care services experienced by infants and toddlers in foster and kinship care", <i>An Australian Study. International Journal of Early Childhood</i>.</p> <p>Broekhuizen, M. et al. (2018), "Child care quality and Dutch 2- and 3-year-olds' socio-emotional outcomes: Does the amount of care matter?", <i>Infant and Child Development</i>, Vol. 27/1, https://doi.org/10.1002/icd.2043.</p> <p>Coelho, V. et al. (2019), "Predictors of parent-teacher communication during infant transition to childcare in Portugal", <i>Early Child Development and Care</i>, Vol. 189/13, pp. 2126-2140, https://doi.org/10.1080/03004430.2018.1439940.</p> <p>Drugli, M. B., et al. (2018), "Elevated cortisol levels in Norwegian toddlers in childcare", <i>Early Child Development and Care</i>, Vol. 188/12, pp. 1682–1693, https://doi.org/10.1080/03004430.2016.1278368.</p> <p>Baumgartner, J. et al. (2017), "How much do they need to be the same? What parents believe about continuity between home and childcare environments", <i>Early Child Development and Care</i>, Vol. 187/7, pp. 1184-1193, http://dx.doi.org/10.1080/03004430.2016.1160387.</p>

Chapter	Topic	Research terms	EBSCO (2017-2019)		Selected results PRELIMINARY
			Number of records	Number of selected records (based on title and abstract)	
					<p>Carlin, C., et al. (2019), "Parental preferences and patterns of child care use among low-income families: A Bayesian analysis", <i>Children and Youth Services Review</i>, Vol. 99, pp. 172–185, https://doi.org/10.1016/j.childyouth.2019.02.006.</p> <p>Scully, H., et al. (2017), "Child care exposure influences childhood adiposity at 2 years: Analysis from the ROLO study", <i>Childhood Obesity</i>, Vol. 13/2, 93–101. https://doi.org/10.1089/chi.2016.0127</p>
	Beliefs	ECEC OR early childhood OR ECCE OR childcare OR child care OR daycare OR day care AND teacher Beliefs OR teacher perspectives OR teacher Perceptions OR Teacher attitudes AND children under 3 years old OR birth to three OR infants OR Toddlers NOT disabilities	102	17 (not all screened)	<p>Sims, M. et al. (2018), "Infant and toddler educare: A challenge to neoliberalism", <i>South African Journal of Childhood Education</i>, Vol. 8/1, pp. 1-8, http://dx.doi.org/10.4102/sajce.v8i1.594.</p> <p>Russo-Zimet, G. and I. Gilat (2017), "Perceptions regarding the care and education of children from birth to age three among students of early childhood education: changes between pre-training and post-training", <i>Journal of Education and Training Studies</i>, Vol. 5/3, pp. 71–85, https://doi.org/10.11114/jets.v5i3.2198.</p> <p>Bussey, K. and D. Hill (2017), "Care as curriculum: Investigating teachers' views on the learning in care", <i>Early Child Development and Care</i>, Vol. 187/1, pp. 128-137, https://doi.org/10.1080/03004430.2016.1152963.</p> <p>Phatudi, N. C.. (2017), "You should give a child love and take them warm-heartedly from their parent": Preschool teachers' practice and understanding of care", <i>Perspectives in Education</i>, Vol. 35/1, pp. 15–27. https://doi.org/10.18820/2519593X/pie.v35i1.2.</p> <p>Ansari, A., and R.C. Pianta (2019), "Teacher–child interaction quality as a function of classroom age diversity and teachers' beliefs and qualifications", <i>Applied Developmental Science</i>, Vol. 23/3, pp. 294–304, https://doi.org/10.1080/10888691.2018.1439749 - 2 and 5 years.</p> <p>Torill Meland, A., E. Kaltvedt., and E. Reikerås (2019). "Toddlers' play in ECEC institutions from a gender perspective", <i>European Early Childhood Education Research Journal</i>, Vol. 27/2, pp. 241–256. https://doi.org/10.1080/1350293X.2019.1580335.</p> <p>Baumgartner, J. et al. (2017), "How much do they need to be the same? What parents believe about continuity between home and childcare environments", <i>Early Child Development and Care</i>, Vol. 187/7, pp. 1184-1193, http://dx.doi.org/10.1080/03004430.2016.1160387.</p>

Chapter	Topic	Research terms	EBSCO (2017-2019)		Selected results PRELIMINARY
			Number of records	Number of selected records (based on title and abstract)	
					<p>Ellis, Y. G., D. Cliff, and A. (2018)," Childcare educators' perceptions of and solutions to reducing sitting time in young children: A qualitative study", <i>Early Childhood Education Journal</i>, Vol. 46/4, pp. 377–385, https://doi.org/10.1007/s10643-017-0867-5.</p> <p>Chan, W. (2019), "Challenges to the infant care profession: Practitioners' perspectives", <i>Early Child Development and Care</i>, Vol. 189/12, pp. 2043–2055, https://doi.org/10.1080/03004430.2018.1432606.</p> <p>Degotardi, S.and Gill, A. (2019), "Infant educators' beliefs about infant language development in long day care settings", <i>Early Years</i>,: Vol. 39/1, pp. 97–113. https://doi.org/10.1080/09575146.2017.1347607.</p> <p>Loizou, E. and S. Recchia (2018), "In-service infant teachers re-envision their practice through a professional development program", <i>Early Education and Development</i>, Vol. 29/1, pp. 91-103, https://doi.org/10.1080/10409289.2017.1343561.</p> <p>Swindle, T. et al. (2018), "About feeding children: factor structure and internal reliability of a survey to assess mealtime strategies and beliefs of early childhood education teachers", <i>International Journal of Behavioral Nutrition and Physical Activity</i>, Vol. 15/1, p. 85, https://doi.org/10.1186/s12966-018-0717-x.</p> <p>Arenhart, D., D. Guimarães and N. Santos (2018), "Teaching at the Daycare Center: care in the education of children from zero to three years of age", <i>Educação & Realidade</i>, Vol. 43/4, pp. 1677-1691, https://doi.org/10.1590/2175-623676576</p> <p>Massing, C. (2018), "African, Muslim refugee student teachers' perceptions of care practices in infant and toddler field placements", <i>International Journal of Early Years Education</i>, Vol. 26/2, pp. 186-200, https://doi.org/10.1080/09669760.2018.1458603</p> <p>Clarke, L., T. McLaughlin and K. Aspden (2019), "Promoting learning during toddlers' peer conflicts: teachers' perspectives", <i>Early Years</i>, Vol. 39/4, pp. 426–440,, https://doi.org/10.1080/09575146.2017.1384919</p> <p>Recchia, S. L. and S.E. McDevitt (2018), "Unraveling Universalist Perspectives on Teaching and Caring for Infants and Toddlers: Finding Authenticity in Diverse Funds of Knowledge", <i>Journal of Research in Childhood Education</i>, Vol. 32/1, pp. 14–31. https://doi.org/10.1080/02568543.2017.1387206</p>

Chapter	Topic	Research terms	EBSCO (2017-2019)		Selected results PRELIMINARY
			Number of records	Number of selected records (based on title and abstract)	
Process quality	Routine based cared	ECEC OR early childhood OR ECCE OR childcare OR child care OR daycare OR day care AND Routine based care AND children under 3 years old OR birth to three OR infants OR Toddlers	6	3	<p>Svinth, L. (2018), "Being touched - the transformative potential of nurturing touch practices in relation to toddlers' learning and emotional well-being", <i>Early Child Development and Care</i>, Vol. 188/7, pp. 924–936. https://doi.org/10.1080/03004430.2018.1446428.</p> <p>Rogers, S. J. et al. (2019), "A multisite randomized controlled two-phase trial of the Early Start Denver Model compared to treatment as usual", <i>Journal of the American Academy of Child & Adolescent Psychiatry</i>, Vol. 58/9, pp. 853–865. https://doi.org/10.1016/j.jaac.2019.01.004.</p> <p>Bussey, K. and D. Hill (2017), "Care as curriculum: Investigating teachers' views on the learning in care". <i>Early Child Development and Care</i>, Vol. 187/1, pp. 128-137,. https://doi.org/10.1080/03004430.2016.1152963</p>
	Family-ECEC partnerships	ECEC OR early childhood OR ECCE OR childcare OR child care OR daycare OR day care AND Family partnerships AND quality AND children under 3 years old OR birth to three OR infants OR Toddlers	27	7	<p>Levere, M. et al. (2019), "Approaches to collaboration: Experiences of the Early Head Start-child care partnerships", <i>Early Education and Development</i>, Vol. 30/8, pp. 975-989, https://doi.org/10.1080/10409289.2019.1656319.</p> <p>Halle, T., et al.. (2019), 'Implementation lessons from six Early Head Start - Child Care Partnerships', <i>Early Education and Development</i>, Vol. 30/8, pp. 990–1008. https://doi.org/10.1080/10409289.2019.1656320.</p> <p>Coelho, V. et al (2019), "Predictors of parent-teacher communication during infant transition to childcare in Portugal", <i>Early Child Development and Care</i>, Vol. 189/13, pp. 2126–2140, https://doi.org/10.1080/03004430.2018.1439940.</p> <p>Baumgartner, J. et al. (2017), "How much do they need to be the same? What parents believe about continuity between home and childcare environments", <i>Early Child Development and Care</i>, Vol. 187/7, pp. 1184-1193, http://dx.doi.org/10.1080/03004430.2016.1160387.</p> <p>Beutler, D., and M. Fenech (2018), "An analysis of the Australian Government's Jobs for Families Child Care Package: The utility of Bacchi's WPR methodology to identify potential influences on parents' childcare choices", <i>Australasian Journal of Early Childhood</i>, Vol. 43/1, pp. 16–24, https://doi.org/10.23965/AJEC.43.1.02.</p> <p>Lang, S., S. Schoppe-Sullivan and L. Jeon (2017), "Examining a self-report measure of parent-teacher cocaring relationships and associations with parental involvement", <i>Early Education and Development</i>, Vol. 28/1, pp. 96-114, https://doi.org/10.1080/10409289.2016.1195672</p>

Chapter	Topic	Research terms	EBSCO (2017-2019)		Selected results PRELIMINARY
			Number of records	Number of selected records (based on title and abstract)	
					Maras, E., S. Lang and S. Schopp (2018), "An observational assessment of parent-teacher cocaring relationships in infant-toddler classrooms", <i>European Early Childhood Education Research Journal</i> , Vol. 26/2, pp. 212-228, https://doi.org/10.1080/1350293X.2018.1442033 .
		ECEC OR early childhood OR ECCE OR childcare OR child care OR daycare OR day care AND teacher-parent partnerships or relations or communication AND quality AND children under 3 years old OR birth to three OR infants OR Toddlers	3	1	Maras, E. Q., S. N. Lang, and S.J. Schoppe-Sullivan(2018), "An observational assessment of parent-teacher cocaring relationships in infant-toddler classrooms", <i>European Early Childhood Education Research Journal</i> , Vol. 26/2, pp. 212-228. https://doi.org/10.1080/1350293X.2018.1442033 .
	Age differences	ECEC OR early childhood OR ECCE OR childcare OR child care OR daycare OR day care AND child age OR age differences AND children under 3 years old OR infants OR toddlers	39	3	King, E. et al. (2016), "Classroom quality in infant and toddler classrooms: impact of age and programme type", <i>Early Child Development and Care</i> , Vol. 186/1, pp. 1821-1835, https://doi.org/10.1080/03004430.2015.1134521 . Barnes, J. and E. Melhuish (2017), "Amount and timing of group-based childcare from birth and cognitive development at 51 months: A UK study", <i>International Journal of Behavioral Development</i> , Vol. 41/3, pp. 360-370, https://doi.org/10.1177%2F0165025416635756 . Urke, H. B., et al. (2018). "Resources for nurturing childcare practices in urban and rural settings: Findings from the Colombia 2010 Demographic and Health Survey", <i>Child: Care, Health and Development</i> , Vol. 44/4, pp. 572-582. https://doi.org/10.1111/cch.12570 .
	Transition practices	Transition to childcare OR ECEC OR early childhood OR ECCE OR child care OR daycare OR day care AND children under 3 years old OR toddlers OR Infants AND infant adjustment	10	3	Bernal, R., et al.. (2019). "The effects of the transition from home-based childcare to childcare centers on children's health and development in Colombia", <i>Early Childhood Research Quarterly</i> , Vol. 47, pp. 418-431. https://doi.org/10.1016/j.ecresq.2018.08.005 - 6 to 60 months. Recchia, S. L. and K. Dvorakova (2018), "Moving from an Infant to a Toddler Child Care Classroom", <i>YC: Young Children</i> , Vol. 73/3, pp. 43-49, https://doi.org/10.2307/26788980 . Bossi, T., S. Brites and C. Piccinini (2017), "Adjustment of babies to daycare: Aspects that facilitate adjustment or not", <i>Paideia</i> , Vol. 27, Suppl. 1, pp. 448-456, https://doi.org/10.1590/1982-432727s1201710 .