

Rapid evidence review: Childcare quality and children's outcomes

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1. Purpose of this rapid evidence review

This review identifies aspects or indicators of quality which are associated with children's outcomes, and in addition looks at the effect size of different early learning and childcare (ELC) programmes or their components where available. The report identifies a number of structural and process indicators which have been described as important in contributing to high-quality ELC and therefore their potential to influence children's outcomes.

However, it is difficult to assess which of the key aspects of quality identified provide the greatest contribution to child outcomes. This is mainly due to the heterogeneity of interventions, the time period in which they were delivered, and the purpose of the interventions themselves (for example targeted versus universal). The methods used to calculate effect size also vary considerably – mainly due to the different tools used to assess quality and children's outcomes. Also, much of the analysis is based on data collected several decades ago.

2. Key findings

This report classifies the main findings into two main types of indicators – 'structural' indicators which include the more regulatory aspects such as group size, child-to-staff ratio and teachers' qualifications, and 'process' indicators which tend to be the 'softer' indicators such as the child's day-to-day experiences such as the interactions and instructional aspects of children's activities with teachers, peers, and materials. It also looks to give a brief summary of studies where an 'effect size' has been produced of the impact of ELC, or components of ELC on various children's outcomes.

Structural indicators:

- Higher qualified teachers and staff, leadership and an experienced, competent and confident workforce provide a better quality environment for children.
- Good working conditions such as staff promotion, continuous development and fair pay helps to reduce staff turnover ensuring greater child stability and focus.
- Delivery of an age-appropriate curriculum with a balance of play, self-regulation and pre-academic activities can help increase quality of ELC provision.

Process indicators:

- Highly trained staff are better equipped through training and professional development to deliver the softer measures or process indicators which provide the necessary care, nurturing and support required for children's developmental needs.
- Better vocabulary ability at age five was statistically significantly associated with attending a pre-school setting with a higher care and support grade.
- Both structural and process indicators of quality are important – however the interplay between them is complex and only together do they deliver the high-quality ELC needed to benefit children.

Effect size:

- Effect sizes of ELC programmes vary considerably depending on type and purpose of intervention.
- Most targeted interventions show a large positive effect on children's outcomes. However, universal programmes also show a positive, albeit weaker effect with the biggest impact on disadvantaged children.

- A UK study has shown that duration of attendance, in terms of number of months or years, has the largest effect on children's outcomes – however quality and effectiveness are also important.

3. Context

Early research on non-parental childcare provision, from as early as the 1960s in the US, focused on whether children attending childcare and pre-school education provision developed differently from those not receiving such provision. In many instances, childcare provision was in the form of intensive targeted programmes for disadvantaged children whose family and home circumstances raised concern for the children's outcomes.¹

In many cases, positive outcomes were identified which often lasted well into children's school years, but outcomes from different programmes varied considerably. Some programmes identified no positive benefits while a few showed negative outcomes depending on the relative balance of quality of care at home and in childcare.² Programmes that showed the most benefit for children tended to be the high-intensity programmes, with a key focus on education and care,³ targeted at disadvantaged children (such as [Head Start](#), [Perry Pre-School Project](#) and the [Abecedarian Project](#)). [Sure Start](#) in Scotland is of a similar early intervention to Head Start; however no impact of the programme on children's outcomes was identified for this review.

Further studies recognised that childcare provision varied considerably and that the key determinants of children's outcomes were the quality or characteristics of their experience both within the childcare setting and the family and home environment.¹

More recently, evidence from both UK and international evaluations and studies of ELC programmes support the fact that all children and especially those from disadvantaged backgrounds can benefit in terms of social, emotional and educational outcomes from attending non-parental childcare.

However, a key finding from research is that any ELC must be of high quality if children are to benefit, with poor-quality ELC shown to have detrimental effects on children.^{4 5 6 7 8}

Research from the Growing Up in Scotland (GUS) study showed wide variation in cognitive ability at age three among children from different backgrounds. Children from less advantaged families were outperformed by their more affluent counterparts, particularly among boys, children with younger mothers, those from lone parent families, children with early developmental difficulties and those with a low birth weight.⁹

Other GUS research has also linked childcare and pre-school experiences to cognitive ability. One analysis found a relationship between early experience of childcare and cognitive ability, with children who experienced between 17 and 40 hours of non-parental childcare a week shown to have better vocabulary acquisition and social development at age three.¹⁰ In another GUS report, compared to no experience of centre-based care or pre-school education, children with any experience tend to have improved language and cognitive skills.¹¹

In terms of the statutory pre-school provision, the Effective Provision of Pre-school Education (EPPE) study found that quality of provision is the key factor associated with making the greatest impact on intellectual and cognitive development – a finding also found in United States based research.^{11 12}

Finally, experiences in the home are also important, as analysis from GUS has shown. Both Bromley⁹ and Melhuish¹³ have demonstrated a positive relationship between the amounts of home learning activities a child experiences and their level of cognitive ability.

4. Quality in childcare

What constitutes quality is perhaps less clear, but the current literature goes some way in defining and identifying the key aspects which make up quality. ELC quality is often defined by the structural and process characteristics that are thought to nurture child development.

Structural characteristics such as group size, child-to-staff ratio, and teachers' qualifications tend to be the indicators upon which key aspects of inspections and regulations are based. These characteristics are also seen as essential statutory regulations in delivering the high-quality care which form many of the softer, process indicators. Process quality refers to the child's day-to-day experiences in ELC settings and includes the social, emotional, physical, and instructional aspects of children's activities and interactions with teachers, peers, and materials.¹⁴

Structural quality is the main objective of statutory quality regulations and national curricula, and a major factor in the macroeconomic costs of ELC (also referred to as Early Childhood Education and Care (ECEC) in England and some other countries), whereas the potential benefits for individuals and society are primarily dependent upon process quality.

This paper does not attempt to define quality, but rather looks at aspects of structural and process quality which have positive benefits on children and therefore should be considered in any ELC delivery model. It mainly focuses on 3 and 4 year olds but many aspects are also highlighted where they are applicable to 2 year olds, and especially for disadvantaged 2 year olds who are included in the Scottish ELC expansion. The findings are also applicable to various settings, such as local authority maintained pre-schools, private, voluntary and independent (PVI) nurseries and childminders (although not all quality aspects are applicable to them in terms of governance and regulations, unless they are delivering the funded entitlement).

The interim findings to this review, providing key messages on quality indicators and children's outcomes (available on request), also briefly investigated two other aspects – whether children from disadvantaged backgrounds received poorer quality ELC and whether multiple or blended care (both formal and informal care) had any impact on children's outcomes. The findings from these two brief reports suggest that children from disadvantaged backgrounds do not necessarily receive poorer quality childcare as they tend to access local authority provision where quality tends to be higher than private or other providers due to the presence of higher qualified staff.* In terms of children accessing multiple childcare providers at an early age, there is little evidence from the UK and Europe showing any detrimental effects on children's development.

5. Methodology

A comprehensive literature search was undertaken by NHS Health Scotland (NHSHS) Knowledge Services using a range of medical, social and educational databases. Peer-reviewed references were screened using RefWorks and Covidence. Grey literature was identified from web searches using Google advanced and searching websites of organisations who actively publish reports on Early Learning and Childcare. Papers were included or excluded based on their relevance to the questions under investigation and of an assessment of the quality and risk of bias presented.

Findings

There are a considerable number of published reports based on individual ELC programmes. These are from countries worldwide and tend to present an overall effect size of attending any ELC programme, which may include global

* Higher qualified staff evidenced in the literature includes teachers, early years professionals, graduates (for example with a BA in Childhood Practice) as well as experienced and well-trained staff (such as through continuous professional development).

quality, duration and intensity rather than looking at specific aspects of quality on children's outcomes.

This review also identified a small number of review level or meta-analysis which have attempted to look at effect size of ELC or different aspects of ELC from a number of studies and includes some from Europe. However, few look at different aspects of ELC and give little indication as to which aspects are most important or effective in terms of children's outcomes.

It should be noted that a large number of studies come from the USA and non-European countries and are based on programmes of intervention which took place from the 1960s onwards when there was a key focus on improving children's outcomes for those from deprived areas. Bearing this in mind, many of the interventions and the findings from these may not be transferable or have the same impact if they were replicated elsewhere.

6. Measuring quality

As highlighted, for children who attend non-parental ELC from an early age, the quality of care needs to be high if children are to benefit. In the UK, this is mainly achieved through the provision of ELC which is subject to quality assurance through inspections and improvement provision to maintain standards.

However, different stakeholders are likely to require different quality measures and measurement tools to help them identify high-quality provision.¹⁵ For example:

- Parents need tools and measures to help select high-quality providers to ensure the health, wellbeing and safety of their children.
- Childcare providers need effective tools and measures to identify their own strengths and possible areas for development, in order to improve the quality of provision offered to children.

- Local authorities need to be able to prioritise funding, support and training using evidence-based decisions, and to encourage providers in quality improvement.
- Policy-makers in central government need to be able to identify where investment is needed to improve outcomes for young children.

Many of these measures tend to focus around two specific aspects of quality – structural aspects and process indicators.

In relation to ‘structural aspects’ of ELC provision, different stakeholders tend to prioritise different aspects depending on their specific priorities and responsibilities. Childcare providers and local authorities are more likely to focus on staff training and qualifications, and the importance of leadership and management. However, parents are more likely than providers to consider structural aspects such as health, safety and supervision as essential components of quality.^{15 16}

In terms of ‘process quality’ (i.e. the actual experiences that occur in early year’s settings), including children’s interaction with caregivers and peers and their participation in different day-to-day activities which are mainly child-led and age appropriate, are generally accepted as important key measures across the wide range of stakeholders mentioned above.¹⁵

To summarise, while this paper does not highlight specific measuring tools, ensuring that ELC inspection criteria give consideration to differential aspects of quality valued by childcare providers, policy-makers and parents could helpfully support decision making.

7. Quality aspects associated with children's outcomes

This section looks at specific aspects of structural and process quality from the literature which have been associated with positive child outcomes.

Structural quality

Structural quality looks at how ELC delivery is designed and organised – often including rules and regulations associated with the accreditation and approval of individual ELC settings.¹⁶ This can include:

- the number of professionally trained staff within an ELC setting
- the design of the curriculum
- regulations associated with the financing of ELC provision
- the ratio of staff to children in any setting
- the physical environment
- arrangements to ensure all children are treated fairly and in accordance with their individual needs and the physical requirements which need to be in place to meet the health
- safety requirements of providing care and education for young children.

In the UK, these are major components of the [Care Inspectorate](#), [Education Scotland](#) and [Ofsted inspections](#) as well relating to some of the key statements under the new Scottish [National Care Standards](#).

Staff qualifications

Although there is good evidence that the best way to measure quality may be through process measures, there is also good evidence that structural features, for example staff qualifications, are an indicator of high-quality

care.¹⁷ The best experiences for children tend to be found where there is a range of staff with complementary skills and higher level qualifications.¹⁸

For example, settings¹⁹ which had access to higher qualified staff, particularly teachers* or staff with specific early childhood qualifications[†] were more likely to offer higher-quality learning experiences. This includes provision of a wider range of age-appropriate activities, development of children's communication skills and higher quality scores as measured by the Infant and Toddlers Environmental Rating Scale (ITERS) and the Early Childhood Environmental Rating Scale (ECERS)[‡]. Other studies also report improved child outcomes where staff in general are better qualified (at least to level 3) and have a graduate Early Years Professional (EYP) in an appropriate discipline or a qualified teacher at degree level.^{7 12 17}

There is also some evidence of a link between structural aspects of quality and child outcomes, finding that children especially from disadvantaged backgrounds made more progress in settings where staff, and managers in particular, were highly qualified.¹⁷

Better educated ELC staff with appropriate training are more likely to improve children's cognitive outcomes through larger vocabularies, increased ability to solve problems and increased ability to develop targeted lesson plans. However, qualifications alone do not affect children's outcomes. Having staff who are adequately trained and supported to create a better pedagogic environment can also make a difference to children's outcomes.²⁰

* If they had a background in early years methodology.

† Such as a BA in Childhood Practice.

‡ ITERS and ECERS: ITERS is designed to assess centre-based child care programmes for infants and toddlers up to 30 months of age. The scale consists of 39 items organised into seven subscales. ECERS is designed to assess centre-based child care programmes for children aged 30 months to 5 years. Scale consists of 43 items organised into seven subscales. It is used as a measure in research studies such as during the EPPE project, and some elements are used for regulatory inspections.

Workforce development

In addition to staff qualifications, staff development – and particularly continuous professional development (CPD) – are also essential components of ELC quality and are linked to the development of children’s cognitive and non-cognitive outcomes.¹⁶ This helps ensures staff are aware of best practice, are continually supported in the workplace, and it helps reduce staff turnover. Research shows that in pre-primary, the effects of specialised in-service training on process quality are larger than those of pre-service training, particularly on collaborative work, support for play, and support for early literacy, mathematics and science.²⁰

Research from the OECD quality project found strong evidence to suggest that better educated and trained staff are more likely to provide high-quality pedagogy and stimulating learning environments, which in turn foster children’s development leading to better learning outcomes. Well educated and trained staff support and nurture children’s development by creating rich and stimulating early learning environments.²¹

Where staff are well trained, with strong leadership and work in ELC settings which support their professional development, higher quality can be expected. However, it is unclear which conditions have the greatest influence on quality and whether changes to training, leadership or conditions of employment make the most significant differences to children and the outcomes of ELC.¹⁶ Research findings suggest a complex interplay exists between different working conditions, with no one area having a large effect on quality. Rather, it is the combination of several components that produces ELC quality.

Staff working conditions

The impact of staff working conditions such as staff-to-child ratio, group size, wages, retention and stability of staff caregiving also show a link with children’s outcomes.^{1 16}

There is some evidence that staff-to-child ratio has a small but significant impact on the quality of interactions between staff and children, as well as on the quality of learning support provided to them. However, due to the wide range of ratios seen in different countries and with different levels of staff qualifications and experience, it is difficult to specify the optimal level for children's outcomes.

The importance of stability of caregiving arrangements and the continuity of caregivers especially for infants and toddlers is partly based on the view that young children need to form bonds of attachment and trust, and also that interactions with children need to involve clear caregiver understanding of the individual child and their developmental needs.¹

Fair working conditions for staff also affect child interactions and stability. Data from various European countries shows considerable difference in the pay gap between ELC staff and teachers, with ELC staff in most countries being poorly trained and paid.¹⁶ Pay is often around minimum-wage levels which impacts on staff retention and overall quality of staff. Good leadership and team relations also impact on staff morale and help reduce the level of staff turnover, which can impact on continuity of care.

Early Years Curriculum

The presence of an explicit curriculum which provides clear purpose, goals and approaches for the education and care of young children within a coherent framework can significantly support the role of practitioners in creating effective learning environments that successfully nurture children's cognitive and socio-emotional development.¹⁶ In addition, evidence suggests that practitioners working with young children under 3 years should also be knowledgeable of how young children develop (theory) and of how to apply this knowledge in pedagogical contexts (practice) which includes attachment theory and practice.⁸

Universal access to ELC itself cannot guarantee high-quality provision and in many countries inequalities still persist among children. Curriculum frameworks can play a role in ensuring the quality of ELC programmes is of a high standard and in many countries, the curriculum framework in pre-primary education has been extended to enhance ELC quality to ensure a better transition between pre-primary and primary education. A balanced curriculum with an emphasis on play, self-regulation, and pre-academic activities has been linked to the highest observed quality of staff–child interactions. However, ELC staff need the skills to provide optimal learning and emotional support for young children's intellectual growth, particularly so in the curriculum area of science, maths and numeracy where there is a shortage of appropriately skilled staff.²⁰

To summarise, in planning for ELC quality improvements, many structural characteristics have an impact on quality and need to be considered simultaneously. In particular, the evidence highlights that staff knowledge and qualifications, levels of experience, curriculum delivery, pay and working conditions and staff ability to provide continuity of care in the context of an early years curriculum are important. Staff accessing continuous professional development for example – provided it is of sufficient length and intensity – is potentially as important as pre-service qualifications in enhancing staff competence and the positive impact on children's outcomes.

Process quality

In contrast to structural aspects, process quality looks at practice within an ELC setting and includes 'softer measures' such as the role of play within the curriculum; relationships and involvement between ELC providers and children's families; relationships and interactions between staff and children, and among children and the extent to which care and education is provided in an integrated way.¹⁶ These are key components of the ECERS as well as components in the Care Inspectorate and Ofsted inspections.

A recent literature review of studies on good practice carried out within EU member states identified several factors associated with ELC process quality that contribute to the achievement of long-lasting positive effects on children's cognitive and non-cognitive development.¹ The review identified several key aspects including the following.

Care and support

- A pedagogical approach that combines education and care for nurturing the holistic development of children's potential.
- Stable relationships, interactions and attachment with sensitive and responsive adults especially for under 2 year olds.
- A focus on play-based activities.

Where examples of the above have been put into practice, children do better and effects are longer lasting, if the care and support is warm, sensitive, stimulating and responsive.¹⁷ This includes providing activities and interactions which are rich in content and stimulation, while also being emotionally supportive, and adapted to the children's developmental level.¹

For example, in the UK, after controlling for differences in children's background, only the grading on the Care Inspectorate's theme of 'care and support' was found to be associated with the assessed child outcomes.¹² Better vocabulary ability at age five was statistically significantly associated with attending a pre-school setting with a higher care and support grade. This association held after controlling for all other pre-school characteristics and differences in children's social background and demographic characteristics.¹²

Staff skills

The quality of many of the process indicators relies on the skills, experience and ongoing training of staff within ELC centres. Their interaction with children and the methods used to deliver the learning curricular are key in terms of:

- staff whose initial and continuing professional development opportunities support reflection and innovative practice accompanied by a strong leadership
- a curriculum that combines staff-initiated and child-initiated activities in order to sustain children's active engagement in the learning process
- staff knowledge and understanding of the curriculum, how young children learn, better at helping children resolve conflicts and helping parents to extend children's learning at home.

In addition to the learning support delivered to children in the ELC setting, staff commitment and interaction with parents to provide the necessary tools and resources for parents to continue supporting their child in the home environment is also important.

Outcomes for disadvantaged children

As previously highlighted, high-quality ELC provides a differential benefit for disadvantaged children. Where parents are less well educated or their children have limited access to a rich home learning environment, their gains in cognitive and socio-emotional development are higher than for children with more resources when exposed to high-quality ELC provision which can provide a rich learning environment. Where additional child support is identified, ELC staff engagement with parents, and involving them as partners in their children's learning, can have a significant impact on children's outcomes.¹⁵

There is also some evidence that vulnerable children also benefit from ELC when it is provided in socially mixed groups rather than in homogeneously

disadvantaged groups.^{1 16} However, where deprivation covers large areas, having socially mixed groups may not be feasible.

To summarise, process indicators such as day-to-day interactions and activities, learning methods and material resources are closely linked to many of the structural aspects (staff experience and qualifications, child-to-staff ratio and group size) identified above. Experienced and well-trained staff have the knowledge and ability to engage, instruct and support children's learning from an early age and especially so for younger children. Supportive environments where children of all abilities are cared for and are able to form stable carer-child relationships are as important for long-term child outcomes as structural measures.

8. Effect sizes of ELC on children's outcomes

A number of studies have demonstrated effect sizes for ELC (or, more rarely, components of ELC) on children's outcomes. Although the studies vary considerably, the eventual outcomes all tend to show positive, albeit weak or modest, effects except for the few intensive US-targeted programmes which show greater effects. A brief overview of some of the more relevant findings are outlined below. Effect sizes show the difference in the average outcome between two groups, for example between those in ELC compared to those who are not, or high-quality provision compared to low-quality provision. The larger the effect size the greater the impact of the intervention. Effect sizes of less than 0.3 is generally deemed as weak, whereas one of 0.7 would be termed strong.

Programmes targeting disadvantaged children

The majority of these programmes are from the US and tend to report effect sizes for impact of the whole individual programme on different child

outcomes rather than specific components. Where specific components are reported they tend to focus on aspects such as duration, intensity, age at starting and occasionally global quality as measured by one of several available tools (Classroom Assessment Scoring System (CLASS), Caregiver Interaction Scale (CIS), ECERS).¹

For example, in the Head Start initiative in the US (which provided comprehensive early childhood education, health, nutrition, and parent involvement services to low-income children and their families) for children aged three and over, and established in 1965, found effect sizes which ranged from 0.09 to 0.24, with the greater effect and longer-lasting effect on children from disadvantaged backgrounds and US migrants. In the later Early Head Start initiative (1994), which again targeted disadvantaged parents and children up to 3 years of age, the effect size on children's cognitive outcomes were similar, ranging between 0.10 and 0.15 at age three, but this effect was not apparent at age five. These effect sizes are interpreted as small and other studies which also looked at effect size on different children's outcomes from the same data also found similar small effects.¹

In contrast, the small 1960s Abecedarian programme showed much greater effect sizes. Cognitive outcomes as large as 0.71 have been reported¹ for children of school age and this persisted up to age 21 (effect size of 0.23). Similarly, large effect sizes for the Perry Pre-school Project were observed of 0.91 after two years of exposure to the programme and positive effects have been reported at age 40 years (effect size of 0.30).

Effect sizes of individual aspects such as quality are usually not reported – duration, intensity and age at exposure to the programmes tend to be the focus of these studies which perhaps reflects the age of the programmes, their intentions and the measurement tools available at that time.

Non-targeted (universal) ELC programmes

While effect sizes for universal ELC for the general population tend to be much lower than for specific intervention programmes targeting disadvantaged children, findings overall suggest that investing in universally available good-quality ELC is beneficial to both parents and children.^{1 22}

In the National Institute of Child Health and Development (NICHD) study, a long-running longitudinal US study looking at the provision of ELC for children of differing backgrounds, childcare quality was significantly (albeit modestly) associated with most outcomes. Children who experienced higher quality childcare scored modestly higher on all cognitive measures. After adjustment for family and other childcare characteristics, regression analyses suggested that children in higher quality care had modestly higher effect sizes on almost all cognitive outcomes ranging from 0.08 to 0.16 depending on age and outcome measured.²³

In the UK EPPE study, duration of attendance in ELC produced the greatest effect sizes ranging from 0.12 for less than 1 year to 0.49 for more than 3 years for reading outcomes. For mathematics, the effect sizes ranged from 0.34 to 0.55 for less than 1 year to more than 3 years respectively. However, the authors also state that effectiveness and quality still show an impact.⁴ The study showed that when compared to children not attending ELC, all quality (low, medium and high) and duration showed a significant positive effect. Overall, longer duration showed a greater benefit than low duration, irrespective of quality. However, the combination of high quality and high duration showed a particularly strong effect size (1.01) for language, and a fairly large effect for pre-reading (0.622). To distinguish the separate quality effect the authors calculated the net difference between low quality high duration and high quality high duration. For language (1.01–0.529) this gave an estimate of 0.481. For pre-reading the difference was somewhat smaller at 0.254 (0.622–0.368).

Similar results are seen in the Effective Pre-school Provision in Northern Ireland (EPPNI). Children who attended high-quality preschool were 2.4 times

more likely to attain the highest grade in national assessments at age 11 in English and 3.4 times more likely in maths than children without preschool attendance, even after controlling for individual and family characteristics such as gender, family size, parental education, and employment.²⁴

In GUS, children who attended centres with a higher care and support rating had better vocabulary outcomes at age five.¹² Similarly in the Effective Pre-school, Primary and Secondary Education (EPPSE), centres with a high global quality rating on the enhanced ECERS (ECERS-E which has literacy and numeracy components) promoted better development of reading and maths.⁴

Meta-analysis of effect size

A number of reports have undertaken meta-analysis (a method for combining data from a number of studies of a particular intervention to develop a single more robust conclusion of its impact) of effect sizes on both USA and European studies. However, as with the individual studies, few look at particular aspects of the ELC programmes. The effect sizes also vary considerably depending on the analysis undertaken, the outcomes and variables used, age of study and also due to secondary analysis by different researchers and the subjectivity of the measures. The examples below are presented to show the variability from published studies.

US studies

Where meta-analysis was carried out based on American studies only, effect sizes were calculated for several outcomes:

- Regular attendance at an ELC initiative compared to no ELC showed a weak overall effect sizes of between 0.13 and 0.23 for a range of children's outcomes for programmes delivered between 1960 and 2000

(which included programmes such as Perry Pre-School and Abecedarian programmes mentioned previously).²⁵

- Pre-school prevention programmes (which also provided a prevention element to reduce long-term health and education problems in the USA) showed a moderately large overall effect size of 0.44 which persisted through Grade 8.²⁶
- Children's intelligence and academic achievement from over 80 studies showed a relatively large effect size of 0.7. The effects of relatively intense interventions remained large even after 5–10 years.²⁷
- Academic achievement from 12 studies looking at cognitive outcomes found an overall average effect size of 0.35 from ELC attendance, with a school readiness effect size of 0.38, and an IQ effect size of 0.43.²⁸
- Quantity, quality, and type of care were all related to children's school readiness and social behaviour at age four and a half. In particular, higher quality care predicted higher entry-level academic skills and language performance.²³

European studies

Where meta-analysis was carried out on European studies only, effect sizes were calculated for a range of outcomes.

As with US studies, the majority of EU meta-analysis focused on attendance at ELC rather than specifically looking at different aspects of the programmes and their impact on children's outcomes.

However, Ulferts³ looked at three aspects of European ELC programmes (which also included findings from longitudinal studies where measures and outcomes from attending ELC centres were derived e.g. EPPSE, EPPNI and GUS). For higher global process quality, pre-academic promotion and more ELC experience they found effect sizes of 0.11, 0.10 and 0.12 respectively on children's developmental outcomes – specifically literacy and numeracy. Interaction focused measures (process measures) were strongly associated

with child outcomes compared to material surroundings. Similarly, staff qualifications, but not the ELC environment, were related to child outcomes. Overall the relationships found were positive and significant but the effect size was weak.

Another European study looked at continuous professional development (CPD) among care staff across nine different countries.²⁹ Although the studies contain different types of CPD including different forms of staff training and use of evidence-based knowledge, and were variable in terms of child outcomes and purpose (such as literacy, numeracy, behaviour), a significantly positive overall effect size of 0.35 was observed for CPD on child outcomes. This is similar to studies in the USA which have also shown effects of between 0.18 and 0.55 on professional development and child outcomes.

In a slightly different study but related to the Jensen study above, Werner³⁰ looked at specific training delivered to caregivers in the US to change the way they worked and interacted in the classroom. After training, the intervention was moderately effective in improving overall caregiver–child interactions with effect sizes ranging from 0.26 to 0.35.

In a study by Nores,³¹ which included EPPE, EPPNI and the extended pre-school provision for vulnerable 2 year olds pilot (2006–2008) in Scotland³² as well as other studies from non-US countries such as Africa, Asia and Central and South America, they compared different early years interventions on child outcomes. They found that an ELC component either on its own or in combination with a nutritional component had slightly better effect sizes compared to cash transfer (vouchers or monetary incentives) or nutrition only (0.3 compared to 0.29 and 0.25).

In terms of any analysis looking at disadvantage and any overall differential impact of ELC on children's outcomes, most authors highlight the difficulty of aggregating data for disadvantaged children due to both limited data and the way disadvantage is measured across different European countries.³

To summarise, international evidence, including meta-analysis, would tend to support the fact that attendance of reasonable duration and intensity and of high quality ELC has beneficial impacts on children's social, emotional and cognitive development. The greatest impact tends to be on small, high intensity pre-school programmes which tend to focus on children from more disadvantaged backgrounds. However, universal programmes such as those from the UK and other European countries can also impact on children's outcomes although the effects observed are much less than with targeted programmes.

9. Aspects of quality and 2 year olds

Although the research on pre-school education (aged three and above) is fairly consistent, the research evidence on the effects of childcare (birth to 3 years) has been more equivocal. Differences in results may relate to the age of starting nursery and also differences in the quality of childcare. In addition, as with the older age group, childcare effects are moderated by family background with outcomes dependent on the relative balance of quality of care at home and in childcare.¹⁶

A recent evidence review⁸ took an in-depth look at aspects of quality and characteristics for children under 3 years. However, the key messages presented here are those specifically relating to 2 year olds (but are likely to be equally applicable to all under 3s and probably 3 and 4 year olds as well).

Four key dimensions of good-quality pedagogy for all children under 3 years were identified:

- Stable relationships and interactions with sensitive and responsive adults.
- A focus on play-based activities and routines which allow children to take the lead in their own learning.
- Support for communication and language.

- Opportunities to move and be physically active.

Although structural and process indicators will vary to some degree depending on age of the children and the setting, many will be applicable to both age groups. Experienced and well trained staff will be able to care for both age ranges and provide the level of care required for their appropriate developmental needs.

In a recently completed study involving children between the ages of 2 and 3 years, early cognitive and socio-emotional developmental benefits (as measured at age 3 years) were associated with use of early childhood education and care (ECEC). Furthermore, the benefits of ECEC were seen regardless of family disadvantage level, and regardless of the quality of the home learning environment.³³

10. Conclusion

The research literature that children's development is affected by a wide range of experiences is well documented, with ELC potentially being a substantial part of this experience. ELC is a complex area with provision delivered in different settings, where staff quality, intensity, duration, social mix as well as the availability and flexibility all impacting on children's outcomes. What does seem to be consistent in the literature is that the quality of the childcare and learning components needs to be of high standard if children are to benefit. How this provision is delivered and subsequently measured poses significant challenges.

Different measures are required by a range of stakeholders depending on what they require the information for. Many will require structural measures for governance and improvement purposes. Others, such as parents, require softer measures which help them decide if their children are safe, happy and thriving.

Structural and process measures are both essential in terms of providing high-quality ELC. Staff knowledge and qualifications, levels of experience, curriculum delivery, as well as continuous development and training are key to high-quality care. Process indicators are closely linked to many of these structural aspects. Experienced and well trained staff have the knowledge and ability to engage, instruct and support children's learning from an early age and especially so for younger children. Supportive environments where children of all abilities are cared for and are able to form stable carer-child relationships are as important for long-term child outcomes as structural measures.

In terms of effect sizes, these tend to vary considerably across all studies, making any firm conclusion difficult. What tends to be clear is that high intensity focused programmes such as the Perry Pre-School or Abecedarian programmes can produce convincing results on various outcomes for children. The impact of universal or non-controlled/experimental ELC provision is still positive but with more modest effect sizes. Universal programmes in Europe tend to be highly regulated compared to their US counterparts. This has at least provided some evidence that programmes of this type can provide benefits to all children, regardless of their background, as well as providing opportunities for parents to enter the labour market or return to education.

Few studies look at the impact of particular aspects of the ELC provision itself, for example aspects of quality, which may give better outcomes if they are given more priority. Most effect sizes tend to be based on the attendance at ELC compared with no attendance, with only occasional reference to correlation to duration, intensity and overall global quality ratings.

This raises some issues as to which of the key aspects of ELC provision has the greatest impact on children. Programmes with high effect sizes in the US are highly individualised and resource intensive so would not be easily replicated or transferrable. The type of process delivered may also prove

controversial – for example direct instruction to children which may not be acceptable in ELC today.

In conclusion, ELC has the potential to impact positively on all children's social, emotional and cognitive outcomes. However, this is dependent on high-quality provision, with greatest impact for those from disadvantaged backgrounds.

It is difficult to measure which aspect(s) of quality provide the greatest impact. Where effect sizes have been provided, they tend to vary considerably and few if any look at specific aspects of the ELC programme – most only provide figures for attendance in any programme. Large effect sizes tend to be observed in small-scale intense programmes. However universal ELC for children from all backgrounds also shows an overall positive effect, although this tends to much less than ELC targeted at specific backgrounds.

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