

# Environmental quality in infant and toddler settings: a descriptive study in spanish contexts

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**Abstract:** Introduction: Enrollment in early childhood education and care (ECEC) has continued to rise among progressively younger children. The aim of this study is to examine the quality of the environment in infant and toddler settings within the Spanish context. Method: A systematic observational approach was employed using the *Infant and Toddler Environment Rating Scale – Third Edition* (ITERS-3). The instrument was applied to an incidental sample of 62 educational centers serving children from birth to three years of age across five Spanish autonomous communities. Results: The findings show that the quality of classroom *Interactions* and *Program structure* was notably strong in the evaluated early childhood settings. In contrast, the *Activities* subscale obtained the lowest ratings, with many items failing to meet the threshold for minimum quality. Discussion: Further research on the quality of infant and toddler education centers is needed to inform educational policy and guide improvement efforts that address the shortcomings identified.

**Keywords:** Early Childhood Education and Care, Educational Quality, Environment Quality, ITERS-3, Learning Conditions, Observation.

## ES La calidad del ambiente en la educación infantil 0-3: un estudio descriptivo en contextos españoles

**Resumen:** Introducción: la escolarización en la primera infancia está incrementándose cada vez desde edades más tempranas. El objetivo de este estudio es analizar la calidad del ambiente en el primer ciclo de Educación Infantil en el contexto español. Método: el procedimiento empleado es la observación sistemática utilizando la escala ITERS-3 (Infant and Toddler Environment Rating Scale) en una muestra incidental de 62 centros educativos que imparten las enseñanzas de 0 a 3 años en cinco comunidades autónomas españolas. Resultados: entre los principales resultados destaca que la calidad de la interacción en las aulas y la estructura del programa parecen ser elementos que destacan positivamente de las escuelas infantiles observadas. Asimismo, la dimensión de actividades es la que menor puntuación ha recibido, no alcanzando el nivel mínimo de calidad en gran parte de los ítems. Discusión: es necesario seguir profundizando en la calidad en los centros de Educación Infantil para impulsar políticas educativas y tomar medidas atendiendo a las carencias detectadas.

**Palabras clave:** Ambiente de Aprendizaje, Educación de la Primera Infancia, Calidad del ambiente, Calidad de la Educación, ITERS-3, Observación.

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## 1. Introduction

### 1.1 Access to Early Childhood Education (0-3)

Early Childhood Education and Care (ECEC)—particularly the stage encompassing the first three years of life—has shifted from being valued primarily for its instrumental role, as its initial expansion coincided with women's entry into the labour market, to being understood as the fulfillment of young children's right to education. This right is established in the Universal Declaration of the Rights of the Child, the Convention on the Rights of the Child, UNESCO frameworks and the Sustainable Development Goals.

Moreover, ECEC's value lies in its documented positive effects for children's later academic achievement and personal development (Castellanos-Serrano & Perondi, 2022; Heckman & Masterov, 2007; Save the Children, 2019), as well as its compensatory role for children from disadvantaged backgrounds (Heckman, 2017; OECD, 2025). Studies such as Bustamante and Cabrera (2022) and UNESCO and UNICEF (2024) further suggest that disadvantaged children who participate in quality ECEC show reduced disparities in university graduation rates and earnings. It is, therefore, reasonable that international and national policy agendas promote guaranteed access to this educational stage for all children.

According to OECD (2023) data, an average of 43% of two-year-olds were enrolled in ECEC in 2021. The *Barcelona Targets* (European Council, 2002) set a minimum enrolment benchmark of at least 33% by 2020. Affordability is a crucial consideration, given ECEC's compensatory function. For under-threes, parental fees vary widely across Europe: Scandinavian countries (including Finland), and the Baltic and Balkan states generally impose lower, income-related fees, whereas countries such as Switzerland, the Netherlands and the United Kingdom have higher fees relative to average wages (European Commission, 2019). This heterogeneity is significant because household income is one of the strongest predictors of enrolment, with lower-income families less likely to participate (OECD, 2021).

The European Commission (2021) and OECD (2025) also report that the pandemic negatively affected access to ECEC, especially among the most vulnerable families—those who stand to benefit the most. Large-scale studies based on representative samples of more than 200 ECEC centres (e.g., Biersteker *et al.*, 2016; Torquati *et al.*, 2011) show a negative association between ECEC quality and neighborhood poverty: higher levels of poverty correspond to lower observed quality. Nevertheless, between 2010 and the year preceding the pandemic (2019), enrolment rates for children age 0–3 increased significantly across all European countries included in the OECD (2021). The European average rose from 26.9% in 2010 to 36.7% in 2018 and 38% in 2019. This trend reflects that an increasing number of very young children spend a substantial part of the day in nursery settings. In the EU-27, under-threes in ECEC spend an average of 27.4 hours per week (European Commission/EACEA/Eurydice, 2019)—that is, over five hours per weekday on average.

UNICEF (2020) frames quality and access in early learning as determinants of equity and sustainability. Following the expansion of access, ensuring quality becomes imperative. In this paper, access refers to the availability of places and coverage of the 0–3 stage across contexts, while *quality* refers to the conditions under which children's care and education are provided.

## 1.2 From expanding access to assuring quality

As shown, Europe has been expanding access to Early Childhood Education and Care (ECEC) particularly in southern countries (Ancheta-Arrabal *et al.*, 2022)—yet the next step must be to ensure quality. In this field, the focus has shifted from measuring “quantity” (enrolment rates) to assessing the *quality* of provision. According to the *EU Quality Framework for ECEC* (Official Journal of the European Union, 2019), access to quality provision for all children contributes to their development and later educational success, although significant progress remains necessary. OECD (2022) reports that no European country conducts annual (or even biennial) evaluations of ECEC quality for children aged 0–2 annually (nor every two years); only Ireland and Iceland conduct such evaluations at least once every three years.

Interest in ECEC quality in Europe has evolved through several milestones. The *World Declaration on Education for All* (UNESCO, 1990) stated in Article 5 that “learning begins at birth”. A true turning point came in 2011 when, at the request of Education Ministers, the European Commission issued the communication *Early Childhood Education and Care: Providing all our children with the best start for the world of tomorrow*. In addition to proposals to expand access, it called for ensuring the *quality of provision* through joint measures among Member States (European Commission, 2011, p. 9). These initiatives materialised in the *Proposal for a Quality Framework for ECEC* (European Commission, 2015). The *European Parliament* (2017), in its agenda on skills for Europe, urged Member States to improve quality and broaden access to early childhood education and care. This was followed by the *2018 Proposal for a Council Recommendation on High-Quality ECEC Systems* (European Commission, 2018) and, subsequently, the *Council Recommendation* derived from these proposals (Official Journal of the European Union, 2019).

To obtain an overall view of quality in this first cycle of ECEC, this study adopts the *Environment Rating Scales (ERS)*—specifically, the *Infant/Toddler Environment Rating Scale, Third Edition (ITERS-3)* (Harms *et al.*, 2020). This tool is widely recognised and used internationally, offering a robust assessment of the quality of early childhood learning environments (Kinkead-Clark, 2022; OECD, 2020). The ITERS-3 encompasses essential aspects of both *structural* and *process* variables. Structural features include the availability of outdoor access, physical layout of learning spaces, and group size, while process variables capture interactions between adults and children, peer interactions, and the learning activities offered. Together, these dimensions provide a comprehensive and detailed view of educational quality (Brunsek *et al.*, 2017; Burchinal, 2018; OECD, 2020; Vist & Os, 2020).

The literature has extensively examined these structural factors. Initial teacher education in ECEC is often considered one of the main predictors of programme quality (Barros *et al.*, 2016; Sylva *et al.*, 2004). The ownership of educational centres—public or private— influences available resources and environmental conditions, thereby influencing overall quality (Slot *et al.*, 2015). Public centres tend to offer higher-quality programmes (Harrison *et al.*, 2024). Moreover, access to outdoor environments is fundamental for children's physical, emotional, and social development, supporting wellbeing and learning through play and exploration

(Tandon *et al.*, 2012). Evaluating these variables with tools such as the ITERS-3 therefore provides a thorough and integrated picture of educational quality in the first cycle of early childhood education.

Considering the systematic review by Vermeer *et al.* (2016), based on observations using these ERS scales, significant differences emerge across continents. Average quality scores vary considerably: in Europe, the mean is 3.82; in North America, 4.09; in South America, 3.58; in Australia and New Zealand, 4.97; and in Asia, 3.29. These findings indicate that the highest quality is observed in Australia and New Zealand, while the lowest is recorded in Asia. Quality in North America is higher than in Europe, South America, and Asia, but not significantly different from Europe. Within this international landscape, it becomes necessary to examine Spain's position.

### 1.3 The Case of Spain: Towards Quality Early Childhood Education

The vision of early childhood education in Spain has undergone significant transformation in recent years. Two recent legislative changes—the enactment of the *Ley Orgánica de Modificación de la LOE* (LOMLOE, 2020) and the publication of Royal Decree 95/2022 of 2 February, which establishes the guidelines for the structure and minimum teaching requirements of early childhood education, including provision for infants and toddlers—have reinforced not only the pedagogical nature of this stage but also the need to guarantee access to education from the earliest years.

In Spain, early childhood education is divided into two stages: the first, from four months to three years of age (infants and toddlers), and the second, from three to six years or until the beginning of primary education. With regard to school ownership, three types coexist: public, private, and state-subsidised (*conciertos*). In the 2024/2025 academic year, 53.1% of children enrolled in infant and toddler education (0–3 years) attended public centres (Ministerio de Educación y Formación Profesional [MEyFP], 2025). Private centres accounted for 28.4% of the total, although there are large regional differences. For example, in the Community of Madrid, almost 70% of centres are private, whereas in Extremadura the figure is only 10% (MEyFP, 2022).

Because infant and toddler education in Spain is not compulsory, educational authorities do not guarantee a place for every child (Turienzo & Manzano-Soto, 2024). However, the objective of increasing the number of publicly funded places is reflected in the most recent education law (LOMLOE, 2020), which mandates efforts over an eight-year period to expand public provision for children aged 0–3. Regarding enrolment rates, the proportion of children attending early childhood education has doubled in the last decade, though substantial age-related variability remains substantial: approximately 15.6% of children under one year are enrolled, compared with more than 73.3% of two-year-olds (MEyFP, 2025).

At present, private provision for infants and toddlers remains substantial, contributing to wider social inequality among different groups, particularly those in situations of greater vulnerability. Moreover, teacher qualifications differ between the two stages of early childhood education. Work with infants and toddlers does not require a university degree: the *Higher Vocational Training Diploma in Early Childhood Education* (*Ciclo Formativo de Grado Superior en Educación Infantil*) is sufficient. By contrast, education for children aged three to six requires a university degree in Early Childhood Education (*Grado en Educación Infantil*).

Following the recognition of this stage as fundamentally educational rather than merely custodial, the next step for Spain is to establish general criteria for evaluating its quality. Spain currently lacks, both at national level and within any of its 17 autonomous regions, a governmental department or institution responsible for assessing the quality of infant and toddler education to ensure that all children—and therefore their families—can be confident that they attend high-quality settings. This makes it necessary to undertake an analysis of the quality of the environment in these classrooms. Within this context, it becomes essential to clarify the concept of 'quality' in infant and toddler education.

### 1.4. Quality of Education and Environmental Quality

According to the OECD review of infant and toddler education (OECD, 2020), the quality of education for children from birth to three years is conceptualised as a multidimensional construct referring to the provision of a safe, healthy, stimulating, and emotionally supportive environment that fosters learning and development in the early years. Consequently, in this study, environmental quality is conceived as a multidimensional construct integrating both structural factors (material resources, staff-child ratios, teacher qualifications, and spatial organisation) and process factors (interactions, learning experiences, and planned activities). This conceptualisation is consistent with international reference frameworks (OECD, 2020; UNESCO, 2017). Thus, environmental quality is not limited to the physical layout of the classroom to encompass the mobilization of resources that support the holistic development of children aged 0 to 3.

The quality of infant and toddler education can be assessed across several dimensions in which, as noted above, both process and structural variables must be considered. From this perspective, the quality of early childhood education can be enhanced through the implementation of policies and practices that promote the systematic use of quality assessment instruments to monitor and continuously improve environmental quality.

Therefore, the objectives of this study are:

General aim

To analyse the environmental quality in infant and toddler classrooms (0–3 years) within Spanish contexts.

Specific aims

1. To describe the levels of quality achieved across the different subscales of the ITERS-3 in the participating centres.
2. To examine differences in quality indicators according to contextual and institutional characteristics of the centres.

## 2. Method

The design of this research corresponds to a quantitative, non-experimental study, based on the analysis of data collected through the Infant/Toddler Environment Rating Scale – Third Edition (ITERS-3; Harms *et al.*, 2020) in a sample of 62 centres located across five Spanish autonomous communities. Descriptive and inferential analyses were conducted.

### 2.1 Population and sample

The population under study comprised all Spanish educational centres providing education and care for children aged 0 to 3 years. A non-probabilistic, incidental sampling method was employed, based on the availability of centres and their voluntary agreement to participate in the study.

The sample (Table 1) consisted of 62 centres located in the autonomous communities of Madrid (67.7%), Andalusia (8.1%), Castilla-La Mancha (6.5%), Navarre (12.9%), and Castile and León (4.8%). Of these, 64.5% were publicly owned, 11.3% privately owned, and 24.2% state-subsidised. The majority of the observed classrooms (43.5%) catered for children aged 2–3 years, and more than half (59.7%) had two educators present. Regarding qualifications, 67.7% of educators held a university degree in Early Childhood Education.

Table 1. Description of the sample

	Category	n	%
Region	Madrid	42	67.7
	Andalusia	5	8.1
	Castilla-La Mancha	4	6.5
	Navarre	8	12.9
	Castile and León	3	4.8
Type of ownership	Public	40	64.5
	Private	7	11.3
	State-subsidised (concerted)	15	24.2
Age group	Infants	9	14.5
	1–2 years	18	29.0
	2–3 years	27	43.5
	Mixed age group	8	12.9
Number of educators per room	1	17	27.4
	2	37	59.7
	3	3	4.8
	1 lead educator plus another for specific activities	5	8.1
Educators' qualification level	Vocational Training Diploma	17	27.4
	Bachelor's Degree / University Diploma in Early Childhood Education	42	67.7
	Master's Degree	3	4.8

### 2.2 Instruments

#### ITERS-

The Infant/Toddler Environment Rating Scale – Third Edition (ITERS-3; Harms *et al.*, 2020) was employed in its Spanish version. This scale is widely used due to its reliability and validity (Kinkead-Clark, 2022). Among its psychometric properties, the scale demonstrates high internal consistency, with a Cronbach's alpha coefficient of 0.914; the subscales also show adequate levels of internal consistency, with Cronbach's alpha values ranging from 0.72 to 0.92 (Harms *et al.*, 2020).

The instrument is designed to measure the quality of the environment in early childhood classrooms for children from birth to 36 months of age. The scale comprises six subscales: Space and Furnishings (4 items), Personal Care Routines (4 items), Language and Books (6 items), Activities (10 items), Interaction (6 items), and Programme Structure (3 items), resulting in a total of 33 items. Each item contains a series of indicators, adding up to a total of 457 indicators across the entire scale.

These indicators are hierarchically organised, with lower levels addressing basic needs and higher levels emphasizing educational and interactive aspects. The ITERS-3 uses a 7-point rating scale to assess the quality observed for each item. Scores are interpreted as follows: 1 indicates inadequate quality, 3 represents the minimum acceptable level, 5 corresponds to good quality, and 7 reflects excellent quality.

Each item includes a series of observable indicators that must be satisfied sequentially: if any indicator within a level is not met, the item cannot be scored above that level. Thus, the final score reflects the highest level achieved without non-compliance with previous indicators.

### 2.3 Procedure

The participating centres received an invitation to participate in the study by email. Upon acceptance, a date was scheduled for the observation. Administration of the scale required a continuous three-hour observation period, coinciding with the most active part of the day. Accordingly, observations were carried out between 09:15 am., and 01:00 pm, depending on each school's organisation, during the months of October 2020 to April 2021. Additional data, including educators' qualifications and the ages of the children, were collected on site prior to the observation. All observations were conducted by a single, highly experienced assessor with over 250 hours of observation using both the ITERS-3 and ECERS-3 scales. The observer also possessed official certification confirming successful completion of the training course for the administration and use of the ITERS-3, issued by the Environment Rating Scales Institute.

### 2.4 Data analysis

Both descriptive and exploratory approaches were applied to the data collected for each dimension under study. The general analytical strategy included a description of the distribution of responses to the different items of the instrument, as well as the overall scores obtained in the various subscales. Subsequently, a comparative analysis of the responses was conducted according to the following variables: (1) access to outdoor space, (2) type of ownership, and (3) educators' qualifications.

First, an exploratory analysis of the collected data was carried out, examining the distribution of responses and calculating the main descriptive statistics (mean, standard deviation, minimum, maximum, number of valid cases, and quartiles). Next, analyses were performed to identify possible differences in the scores according to centre ownership, access to outdoor space, and teacher qualification level. When the variables exhibited a normal distribution, a parametric approach was employed using the Student's t-test and ANOVA. In cases where the normality assumption was not satisfied, the non-parametric Mann-Whitney U test was applied.

The statistical package used for data processing and analysis was IBM SPSS Statistics, version 27.

## 3. Results

### 3.1 Overall room quality

The overall mean score on the Infant/Toddler Environment Rating Scale – Third Edition (ITERS-3) for the Spanish sample was 4.76, indicating an overall room quality level within the minimal quality range but approaching the good quality threshold (5). Among all rooms observed, 4.8% scored below 3 (inadequate quality), 43.6% scored within the minimal range (3-4.99), and 51.6% achieved a score of 5 or higher (good quality). The highest room score recorded was 6.16, and no room reached the maximum possible value of 7.

At the level of the six ITERS-3 subscales (Table 2), the results for Spanish rooms showed substantial variation. The lowest mean score corresponded to the subscale Activities ( $M = 2.45$ ), whereas the highest means were obtained in Interaction ( $M = 5.93$ ) and Program Structure ( $M = 5.68$ ). Intermediate mean values, close to the good quality level, were observed in Personal Care Routines ( $M = 4.95$ ) and Language and Books ( $M = 4.77$ ).

None of the subscales reached a mean score of 6 or higher. However, most displayed a wide range of variability: the subscales Space and Furnishings, Interaction, and Program Structure included rooms with scores ranging from 1-2 points up to 7. In contrast, the subscale Activities exhibited the narrowest distribution, with no room exceeding a score of 5.13.

These findings suggest that, overall, Spanish infant and toddler rooms demonstrate adequate levels of quality, particularly in the areas of staff-child interaction and daily structure, while aspects related to activity provision—such as opportunities for art, music, or science exploration—show greater potential for improvement.

Table 2.4 Mean quality scores by ITERS-3 subscale

ITERS-3 Subscale	N	M	SD	Min	Max	Kurtosis
Space and Furnishings	62	4.23	1.68	1.00	7.00	-.67
Personal Care Routines	62	4.95	1.40	1.75	7.00	-.91
Language and Books	62	4.77	1.34	2.33	6.75	.26
Activities	62	2.45	0.88	1.00	5.13	1.56
Interaction	62	5.93	1.09	2.00	7.00	3.12
Program Structure	62	5.68	1.35	2.33	7.00	.00
Total Score	62	4.76	.90	2.46	6.16	-.18

At the item level (Table 3), scores ranged from 1.3 (*Promoting acceptance of diversity*) to 6.4 (*Staff-child interaction*). Of the 33 items comprising the *ITERS-3*, nine obtained scores below 3, indicating inadequate quality. These items predominantly corresponded to the *Activities* subscale (*Fine motor, Art, Music and movement, Blocks, Dramatic play, Nature/science, Math/number*), with two exceptions: *Encouraging children's use of books* ( $M = 2.73$ ) from *Language and Books*, and *Promoting acceptance of diversity* ( $M = 1.31$ ) from *Interaction*.

Ten items were rated within the minimal range (3.0–4.99). Among them, three achieved scores above 4.92, approaching the good quality category. This pattern is particularly evident in two subscales. Within *Space and Furnishings*: *Display for children* ( $M = 3.65$ ), *Furnishings for care, play, and learning* ( $M = 4.76$ ), and *Room arrangement* ( $M = 4.94$ ); and within *Personal Care Routines*: *Meals/snacks* ( $M = 4.13$ ), *Health practices* ( $M = 4.58$ ), and *Diapering/toileting* ( $M = 4.92$ ). Also falling within this range are *Encouraging vocabulary development* ( $M = 4.29$ ) and *Staff use of books with children* ( $M = 3.37$ ) from *Language and Books*, as well as *Appropriate use of technology* ( $M = 4.00$ ) and *Gross motor* ( $M = 4.95$ ) from *Activities*.

At the good quality level (5.0–6.99) are nearly half of the items in the scale, a total of 14 distributed across all subscales except *Activities*. Within this range fall all the items from *Interaction* and *Program Structure* and half of those from *Language and Books*. The highest-scoring items were *Staff-child interaction* ( $M = 6.55$ ), *Providing physical warmth/touch* ( $M = 6.44$ ), *Responding to children's communication* ( $M = 6.35$ ), and *Safety practices* ( $M = 6.19$ ).

Table 3. Descriptive statistics of *ITERS-3* item scores

Subscale / Item	n	M	SD	Min	Max	Kurtosis
<b>Space and Furnishings</b>	<b>62</b>	<b>4.78</b>	<b>1.29</b>	<b>1.75</b>	<b>7.00</b>	<b>-0.67</b>
1. Indoor space	62	5.81	2.29	1	7	0.45
2. Furnishings for care, play, and learning	62	4.76	2.22	1	7	-1.37
3. Room arrangement	62	4.94	1.97	1	7	-1.45
4. Display for children	62	3.65	1.71	1	7	-0.99
<b>Personal Care Routines</b>	<b>62</b>	<b>4.95</b>	<b>1.25</b>	<b>2.25</b>	<b>7.00</b>	<b>-0.91</b>
5. Meals/snacks	62	4.13	2.39	1	7	-1.68
6. Diapering/toileting	62	4.92	1.42	2	7	-0.97
7. Health practices	62	4.58	2.09	1	7	-1.09
8. Safety practices	62	6.19	1.23	3	7	-0.09
<b>Language and Books</b>	<b>62</b>	<b>4.77</b>	<b>1.07</b>	<b>1.83</b>	<b>6.67</b>	<b>0.26</b>
9. Talking with children	62	6.21	1.52	2	7	3.32
10. Encouraging vocabulary development	62	4.29	1.12	1	7	1.77
11. Responding to children's communication	62	6.35	1.29	1	7	7.42
12. Encouraging children to communicate	62	6.21	1.31	1	7	6.55
13. Staff use of books with children	62	3.37	2.01	1	7	-1.35
14. Encouraging children's use of books	62	2.73	2.11	1	7	-0.63
<b>Activities</b>	<b>62</b>	<b>2.45</b>	<b>0.80</b>	<b>1.11</b>	<b>5.13</b>	<b>1.56</b>
15. Fine motor	62	2.90	2.05	1	7	1.15
16. Art	53	2.34	1.58	1	7	1.82
17. Music and movement	62	2.15	0.86	1	7	6.64
18. Blocks	62	2.03	1.85	1	7	1.38
19. Dramatic play	62	2.37	1.63	1	7	0.27
20. Nature/science	62	1.85	1.44	1	7	1.73
21. Math/number	62	1.61	1.33	1	7	6.64
22. Appropriate use of technology	14	4.00	2.98	1	7	-2.29
23. Promoting acceptance of diversity	62	1.31	0.46	1	2	-1.30
24. Gross motor	62	4.95	2.19	1	7	-1.48
<b>Interaction</b>	<b>62</b>	<b>5.93</b>	<b>1.14</b>	<b>1.50</b>	<b>7.00</b>	<b>3.12</b>
25. Supervision of gross motor play	62	5.31	1.96	1	7	-0.18
26. Supervision (non-gross motor)	62	5.81	1.91	1	7	0.58
27. Peer interaction	62	5.73	1.41	1	7	2.26
28. Staff-child interaction	62	6.55	1.12	2	7	5.00
29. Providing physical warmth/touch	62	6.44	1.10	2	7	7.78
30. Guiding children's behaviour	62	5.77	1.48	1	7	0.38
<b>Program Structure</b>	<b>62</b>	<b>5.68</b>	<b>1.65</b>	<b>1.00</b>	<b>7.00</b>	<b>0.00</b>
31. Schedule and transitions	62	5.90	1.79	1	7	1.18
32. Free play	62	5.65	1.76	1	7	1.50
33. Group play activities	27	5.00	2.30	1	7	-0.83
<b>Total <i>ITERS-3</i> score</b>	<b>62</b>	<b>4.76</b>	<b>0.90</b>	<b>2.46</b>	<b>6.16</b>	<b>-1.18</b>

### 3.2 Outdoor space access

To examine differences across the six *ITERS-3* subscales and the total score in relation to the variable access to outdoor space, the assumptions of normality and homoscedasticity were first assessed. In this case, not all model assumptions were satisfied; the Shapiro-Wilk test indicated that normality could not be assumed for three subscales (*Space and Furnishings*:  $p = .223$ ; *Personal Care Routines*:  $p = .157$ ; *Language and Books*:  $p = .099$ ; *Activities*:  $p = .045$ ; *Interaction*:  $p < .001$ ; *Program Structure*:  $p < .001$ ).

Subsequently, Levene's test for equality of variances was applied to assess homoscedasticity, confirming that this assumption was met in all subscales (*Space and Furnishings*:  $p = .821$ ; *Personal Care Routines*:  $p = .613$ ; *Language and Books*:  $p = .655$ ; *Activities*:  $p = .614$ ; *Interaction*:  $p = .983$ ; *Program Structure*:  $p = .383$ ).

The results obtained from the parametric Student's *t*-test showed statistically significant differences according to the variable access to outdoor space in the subscales *Space and Furnishings* ( $p = .013$ ) and *Personal Care Routines* ( $p = .029$ ) (Table 4), with a medium effect size (0.7–0.6). Likewise, for those subscales that did not meet the normality assumption, the non-parametric Mann-Whitney test was applied, yielding similar results (Table 5).

Table 4. Student's *t*-test – Access to outdoor space

Subscale	<i>t</i>	<i>df</i>	<i>p</i>	Mean difference	SE difference	Cohen's <i>d</i>	SE Cohen's <i>d</i>
Space and Furnishings	2.571	60	<b>.013</b>	0.893	0.347	<b>0.719</b>	<b>0.290</b>
Personal Care Routines	2.237	60	<b>.029</b>	0.759	0.339	<b>0.626</b>	<b>0.288</b>
Language and Books	1.073	60	.288	0.321	0.299	0.300	0.282
Activities	1.296	60	.200	0.290	0.224	0.362	0.282
Interaction	-0.091	60	.928	-0.029	0.324	-0.025	0.280
Program Structure	1.250	60	.216	0.574	0.460	0.350	0.282
<b>Total</b>	<b>1.878</b>	<b>60</b>	<b>.065</b>	<b>0.468</b>	<b>0.249</b>	<b>0.526</b>	<b>0.285</b>

Table 5. Mann-Whitney Test – Acces to outdoor space

Subscale	W	<i>df</i>	<i>p</i>	Hodges-Lehmann estimate	Rank-biserial correlation	SE rank-biserial correlation
Space and Furnishings	555.500	–	<b>.013</b>	1.000	0.403	0.161
Personal Care Routines	535.500	–	<b>.031</b>	0.750	0.352	0.161
Language and Books	485.000	–	.169	0.333	0.225	0.161
Activities	497.500	–	.117	0.333	0.256	0.161
Interaction	384.500	–	.864	$-7.132 \times 10^{-5}$	-0.029	0.161
Program Structure	463.000	–	.283	$1.326 \times 10^{-5}$	0.169	0.161
Total	529.500	–	.039	0.484	0.337	0.161

### 3.3 Ownership

Regarding the ownership of the centre (public, private, or state-subsidised), the assumption of homogeneity of variances was confirmed according to Levene's test results for the *Space and Furnishings* subscale ( $F = 0.565$ ;  $p = .571$ ). The results of the ANOVA revealed statistically significant differences in the *Space and Furnishings* dimension according to the ownership of the centre ( $F = 16.672$ ;  $p < .001$ ). Specifically, these differences were observed between public and private centres ( $p = .015$ ) with a large effect size (1.179), and between public and state-subsidised centres ( $p < .001$ ) with a high effect size (1.660), with public centres showing higher scores in all cases (Table 6).

Table 6. Space and Furnishings scores – Ownership of the centre

ANOVA-Total							
Cases	Sum of Squares	df	Mean Square	F	p	$\eta^2$	$\omega^2$
Ownership	37.049	2	18.524	16.672	< .010	0.361	0.336
Residuals	65.557	59	1.111	–	–	–	–

Note. Type III Sum of Squares.

#### Post Hoc Comparison - Ownership

Comparison	Mean Difference	SE	<i>t</i>	Cohen's <i>d</i>	<i>p</i> <sub>tukey</sub>
Public – Private	1.243	0.432	2.878	1.179	.015 *
State-subsidised	1.750	0.319	5.483	1.660	< .001 **
Private – State-subsidised	0.507	0.483	1.051	0.481	.548

\* $p < .05$ , \*\*  $p < .01$

Note. P-value adjusted for comparing a family of 3.

The result of Levene's test for the *Programme Structure* subscale ( $F = 0.218$ ;  $p = .805$ ) confirmed the assumption of homogeneity of variances. Subsequent ANOVA revealed statistically significant differences in the *Programme Structure* dimension according to the ownership of the centre (public, private, or state-subsidised) ( $F = 4.193$ ;  $p < .05$ ). However, in this case, significant differences related to ownership were observed exclusively between public and private centres ( $p = .023$ ), with a large effect size (1.114) (Table 7).

**Table 7.** *Programme Structure scores – Ownership*

ANOVA - Total							
Cases	Sum of Squares	df	Mean Square	F	p	$\eta^2$	$\omega^2$
Ownership	20.674	2	10.337	4.193	0.020	0.124	0.093
Residuals	145.443	59	2.465				

*Note.* Type III Sum of Squares

Post Hoc Comparisons - Titularidad							
		Mean Difference	SE	t	Cohen's d	$p_{tukey}$	
Public	Private	1.749	0.643	2.719	1.114	0.023	*
	State-subsidised	0.725	0.475	1.525	0.462	0.287	
Private	State-subsidised	-1.024	0.719	-1.425	-0.652	0.335	

\*  $p < .05$

*Note.* P-value adjusted for comparing a family of 3

Finally, after confirming the assumption of homogeneity of variances for the total *ITERS-3* score ( $F = 0.785$ ,  $p = .461$ ), an ANOVA was conducted, revealing statistically significant differences (Table 8). Post hoc comparisons indicated that these significant differences were found between public and private early childhood education centres, with a large effect size (1.113).

**Table 8.** *Total Score- Ownership*

ANOVA - Total							
Cases	Sum of Squares	df	Mean Square	F	p	$\eta^2$	$\omega^2$
Ownership	7.352	2	3.676	5.039	0.010	0.146	0.115
Residuals	43.040	59	0.729				

*Note.* Type III Sum of Squares

Post Hoc Comparisons - Ownership							
		Mean Difference	SE	t	Cohen's d	$p_{tukey}$	
Public	Private	0.951	0.350	2.718	1.113	0.023	*
	State-subsidised	0.557	0.259	2.155	0.652	0.088	
Private	State-subsidised	-0.394	0.391	-1.007	-0.461	0.575	

\*  $p < .05$

*Note.* P-value adjusted for comparing a family of 3

### Teacher qualification

The analysis of variance showed no statistically significant differences in any of the subscales or in the total score as a function of teacher qualification.

### 4. Discussion and conclusions

The analysis of Spanish *ITERS-3* scores and its different subscales provides valuable insights into the quality of the environment in infant and toddler education settings within the Spanish context. It also enables comparative analysis with other countries such as the United Kingdom, the Netherlands, Norway, and Portugal. This study offers the scientific community a more detailed view of the strengths and areas for improvement in Spanish early childhood education, contributing to a broader understanding of educational quality in the European context.

First, the total *ITERS-3* score falls within the moderate-quality range, approaching the "good" level ( $M = 4.76$ ), positioning Spain favourably in the international context. Referring to the previously cited meta-analysis (Vermeer *et al.*, 2016), which used the *Environment Rating Scales (ERS)*, this score is higher than the average obtained in Europe, North America, South America, and Asia, though slightly lower than that of Australia and New Zealand ( $M = 4.97$ ).

At the subscale level, Spanish *ITERS-3* scores are generally good and follow a pattern similar to that found in countries such as the United Kingdom, the Netherlands, and Norway, where the *Activities* subscale receives the lowest scores, whereas *Interaction* attains the highest (Bjørnestad & Os, 2017; Morales-Murillo *et al.*, 2020). This pattern is consistent with previous studies highlighting the importance of high-quality educator-child interactions for socio-emotional and cognitive development in early childhood. The high scores in *Interaction* suggest that, in Spain—as in these other countries—educational environments prioritise interpersonal relationships. In contrast, the lower scores in the *Activities* subscale indicate areas for improvement, particularly in the diversity and quality of educational activities offered to children. This underscores the need to develop and implement more varied and enriching programmes that stimulate different aspects of child development.

However, differences were found in *Personal Care Routines* and *Listening and Talking*, with lower scores than those reported in the United Kingdom (Melhuish, 2017) and significantly higher than those in Portugal (Bjørnestad & Os, 2017). In Spain, the lower values in these subscales compared with the United Kingdom may suggest that practices related to hygiene, feeding, and communication require greater attention and improvement.

Among the subscale-level findings, this study reveals that early childhood education in Spain faces challenges in promoting a greater number of age-appropriate activities involving mathematics and science—those that provide learning opportunities for children to explore, ask questions, identify relationships, and build the foundations of logical and scientific thinking in playful, hands-on contexts. Such activities might include classification, seriation, matching, measuring, analysing cause-and-effect relationships, observing natural phenomena, experimenting with materials, and discovering the environment. Likewise, the results point to the need to strengthen practices that promote the acceptance of diversity and to increase engagement in music and movement, art, block play, and dramatic play.

The results also indicate that Spanish early childhood centres participating in the study tend to devote greater attention to gross-motor activities than to fine-motor ones in the 0–3 age range. Conversely, research on quality in the second cycle of early childhood education (ages 3–6) shows a greater emphasis on fine-motor skills (Early *et al.*, 2018), likely because early literacy learning begins during this stage, involving numerous preparatory activities. Nevertheless, musical stimulation is recognised as a factor that enhances general language processes—particularly phonological awareness, which is a key component of literacy acquisition (Xóchitl, 2024).

This study therefore not only identifies specific areas where Spanish early childhood education centres can focus their efforts to improve quality but also provides a comparative framework that can guide policymakers and researchers in evaluating and developing strategies to raise educational standards. International comparison allow for the identification of best practices and the adaptation of successful strategies from other contexts to the Spanish reality, thereby contributing to the continuous improvement of early childhood education quality.

Furthermore, the study explored possible associations between the quality indicators measured by the *ITERS-3* and certain structural characteristics, such as centre ownership. Evidence was found of significant differences between public and private centres, with public centres achieving higher overall quality scores—consistent with recent research conducted in Australia (Harrison *et al.*, 2024). Similarly, differences between public and private centres were notable in the *Space and Furnishings* and *Programme Structure* subscales, again favouring public settings.

Some unexpected findings emerged as well. Notably, no statistically significant differences were observed between the overall quality and teachers' initial qualification. This contrasts with results from studies using the *ITERS-R* in other countries (Bjørnestad & Os, 2017). Possible explanations include the relative homogeneity in the educational background of the participating educators—most being university-qualified in early childhood education—or the possibility that initial training does not fully reflect actual professional competence in everyday practice. Other factors, such as practical experience, ongoing professional development, and working conditions, may exert a more direct and meaningful influence on the observed quality.

Additionally, access to outdoor space proved to be an important variable in assessing the quality of the learning environment in early childhood centres. Significant differences were observed in both *Space and Furnishings* and *Personal Care Routines* depending on whether the centre had outdoor areas. Specifically, centres with access to outdoor spaces tended to achieve higher scores in these subscales, suggesting that the physical environment plays a crucial role in the quality of the educational experience—findings consistent with prior studies such as Tandon (2012). Outdoor access not only provides opportunities for play and physical exploration but also fosters children's emotional and social well-being, both of which are essential for holistic development. This finding underscores the importance of considering the design and infrastructure of early childhood centres as key components of educational quality. Educational policies and urban planning regulations should promote and facilitate access to safe, stimulating outdoor environments in early childhood settings, recognising their positive impact on multiple aspects of child development.

This study has limitations that should be considered when interpreting the results. The sample size may limit the generalisability of the findings to the overall population of early childhood education centres in Spain. The exploratory nature of this analysis, common in social sciences, allows the identification of trends and areas of interest; however, larger samples are needed to confirm these results and derive more robust conclusions.

Future research could expand the sample to enhance representativeness. Longitudinal studies following children throughout their educational trajectories could also provide a more comprehensive view of the

long-term effects of quality in early childhood education. Finally, comparative studies between countries and regions could yield deeper insights into best practices and effective policies in the field of early childhood education.

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