



ORIGINAL

Phonological awareness and reading skills: a correlational study from pedagogical practice

Conciencia fonológica y habilidades lectoras: un estudio correlacional desde la práctica pedagógica

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ABSTRACT

Phonological awareness has been widely recognized as a key skill in learning to read and write, particularly during the early years of formal education. This study aimed to analyze the relationship between phonological awareness and the development of reading and writing skills students from a public educational institution in Ecuador. A quantitative, correlational, and cross-sectional approach was used, with a sample of 160 students. Standardized instruments were applied to assess phonological awareness, reading comprehension, reading fluency, and written production. Additional information was collected regarding students' frequency of out-of-school reading. Statistical analyses included Pearson correlations, one-way ANOVA, and Student's t-test. The findings revealed significant positive correlations between phonological awareness and reading comprehension ($r = 0,46$), as well as written production ($r = 0,41$), confirming the influence of this metalinguistic skill on academic performance. However, reading frequency outside school did not show statistically significant differences in phonological awareness levels among the groups compared ($p > 0,05$). These results suggest that reading alone, without explicit pedagogical guidance, may not be sufficient to foster phonological development. It was concluded that systematic and planned instruction in phonological awareness must be an integral part of early literacy programs. Additionally, enhancing teacher training in phonological strategies and promoting family reading practices with guided support are recommended. This research provides relevant empirical evidence for the design of sustainable interventions in Latin American school contexts and contributes to the ongoing discussion on educational quality and effective literacy learning.

Keywords: Phonological Awareness; Reading Comprehension; Written Production; Early Literacy; Pedagogical Practice.

RESUMEN

La conciencia fonológica ha sido reconocida como una habilidad clave en la adquisición de la lectura y la escritura, especialmente durante los primeros años de escolaridad. El presente estudio tuvo como objetivo analizar la relación entre la conciencia fonológica y el desarrollo de habilidades lectoras y de producción escrita en estudiantes de Educación General Básica, en el contexto de una institución educativa del sistema público ecuatoriano. Se aplicó un enfoque cuantitativo, correlacional y transversal, con una muestra de 160 estudiantes. Los datos se obtuvieron a través de instrumentos estandarizados que midieron conciencia fonológica, comprensión lectora, fluidez lectora y producción escrita. Además, se recogió información sobre la frecuencia de lectura extracurricular. El análisis estadístico incluyó correlaciones de Pearson, prueba ANOVA y t de Student. Los resultados mostraron correlaciones positivas significativas entre la conciencia fonológica y la

comprensión lectora ($r = 0,46$), así como con la producción escrita ($r = 0,41$), lo que evidenció la influencia de esta habilidad metalingüística en el desempeño académico. No obstante, la frecuencia de lectura extracurricular no mostró diferencias significativas en los niveles de conciencia fonológica entre los grupos comparados ($p > 0,05$), lo cual sugiere que la lectura por sí sola, sin un acompañamiento pedagógico explícito, no garantiza el desarrollo fonológico esperado. Se concluyó que la enseñanza sistemática y planificada de la conciencia fonológica debe formar parte estructural de los programas de alfabetización inicial. Asimismo, se propone fortalecer la formación docente en estrategias fonológicas y fomentar prácticas lectoras familiares guiadas. Esta investigación aporta evidencia empírica relevante para el diseño de intervenciones sostenibles en contextos escolares latinoamericanos, contribuyendo al debate sobre calidad educativa y aprendizaje efectivo de la lectoescritura.

Palabras clave: Conciencia Fonológica; Comprensión Lectora; Producción Escrita; Alfabetización Inicial; Práctica Pedagógica.

INTRODUCTION

In the context of Latin American education systems, the acquisition of reading and writing skills represents a persistent challenge that transcends the school environment and compromises the comprehensive development of individuals. Despite institutional efforts to strengthen literacy, multiple studies have shown significant deficiencies in reading comprehension, verbal fluency, and written production among elementary school students in the region.^(1,2,3,4) These problems not only limit academic performance but also restrict individuals' full participation in social, cultural, and economic life.

School success, educational equity, and inclusion depend largely on functional mastery of reading and writing from an early age.

Among the various factors involved in the literacy process, phonological awareness has emerged as a central construct for understanding reading and writing development. This is defined as the ability to identify, segment, and manipulate speech sounds at different levels (syllabic, intrasyllabic, and phonemic), and its importance has been supported by abundant scientific evidence as a predictor of reading success, especially in the early years of schooling.^(5,6,7)

Longitudinal studies have shown that children with low phonological awareness have greater difficulty decoding words and, therefore, developing fluent and comprehensive reading.^(8,9) In fact, authors such as Høien and Lundberg⁽¹⁰⁾ argue that phonological awareness is not simply a facilitator of reading learning, but its structural prerequisite.

The decisive role of phonological awareness has been corroborated by several meta-analyses. Melby-Lervåg et al.⁽¹¹⁾, in a study that grouped 129 intervention effects on phonological awareness, concluded that programs that combine phonological instruction with decoding strategies produce significant improvements in reading and writing. These findings are consistent with the contributions of Ehri et al.⁽¹²⁾, who identified a consistent advantage of programs that include phonological components compared to those that are limited to global or visual approaches. Similarly, synthesis studies in Spanish—such as that by Jiménez and Guzmán⁽¹³⁾—report a moderate to high relationship between the level of phonological awareness and reading comprehension skills in Spanish-speaking schoolchildren.^(14,15)

However, knowledge about this relationship remains limited in diverse sociocultural and linguistic contexts, such as those that characterize many Latin American countries. Although most research has been conducted in English-speaking populations, where the orthographic system is less transparent than Spanish, the association pattern cannot be assumed universally. Nag and Perfetti⁽¹⁶⁾ emphasize that the transfer of pedagogical or intervention models must take into account the characteristics of the language's phonological and orthographic system, as well as the sociocultural practices associated with literacy.

For their part, Solari and del Rosario Sánchez,⁽¹⁷⁾ in a study conducted in Mexico, showed that socioeconomic status, access to educational resources, and family practices have a decisive influence on the development of phonological awareness, especially in highly vulnerable contexts.

In Ecuador, academic literature on phonological awareness and its impact on literacy is still in its infancy. Research such as that by López et al.⁽¹⁸⁾ and Rodríguez et al.⁽¹⁹⁾ shows a positive correlation between phonological proficiency and reading performance in primary school students; however, these experiences have been limited to small samples or lack integrative methodological approaches.

In addition, there is a persistent gap between scientific knowledge and pedagogical practices. Many teachers lack specialized training in phonological strategies, and educational institutions do not always have materials or policies that promote their incorporation into the curriculum.^(20,21)

This disconnect between scientific evidence and educational practice constitutes a critical gap that this

research aims to address. The present study proposes a comprehensive approach to analyze how phonological awareness relates to the development of reading and writing in fifth-grade students in General Basic Education (EGB) in an urban setting in Ecuador. It is based on the assumption that this skill not only has a predictive function in reading performance but is also mediated by contextual variables such as out-of-class reading habits, teacher perception, pedagogical design, and institutional conditions.

The choice of a mixed approach responds to the need to capture the complexity of the phenomenon from multiple dimensions. Quantitative data collection through standardized tests is complemented by teacher and student surveys, as well as classroom observations, allowing for the analysis of not only performance levels, but also the beliefs and practices that shape phonological development. In addition, the study incorporates the institutional perspective, including school policies and resource availability, which is essential for understanding the real possibilities for implementing significant changes.

The relevance of this research lies both in its empirical contribution and its practical application. At the scientific level, it seeks to generate contextualized evidence on a topic that is still under-explored in the country, overcoming the fragmentation of previous studies. At the pedagogical level, it aims to offer clear guidelines for the design of educational interventions that strengthen phonological awareness from an inclusive and sustainable perspective. Ultimately, the goal is to contribute to the development of policies and strategies that ensure functional, equitable, and culturally relevant literacy.

The study aims to analyze the influence of phonological awareness on the development of reading and writing skills in students in basic general education at an urban educational institution in Ecuador, through the application of standardized instruments and the analysis of pedagogical and contextual variables.

Research hypothesis:

- H1: There is a positive and significant relationship between the level of phonological awareness and performance in reading and writing.
- H2: Frequent reading and writing practice outside school hours is associated with better phonological development and reading performance.
- H3: Teachers' positive perceptions of phonological awareness are linked to the application of effective pedagogical strategies in reading and writing.

METHOD

The research is framed within a mixed methodological approach with a quantitative correlation and non-experimental longitudinal design. The choice of a mixed sequential explanatory design responds to the need to understand in depth the influence of phonological awareness on the development of reading and writing skills, integrating both objective data and perceptions and teaching practices. The mixed approach has proven particularly useful for exploring complex educational phenomena and variables in which cognitive, contextual, and sociocultural variables converge, allowing for methodological triangulation and greater interpretive validity.^(1,2)

The research was carried out in an educational unit in the metropolitan district of Quito, Ecuador. This public institution serves students from urban areas of medium and low socioeconomic status. The population consisted of students from all levels of General Basic Education (EGB), aged between 9 and 11 years. From a universe of 508 students enrolled in morning and afternoon classes, a representative sample of 150 participants was selected using stratified probability sampling, with a confidence level of 95 % and a margin of error of 5 %.

Inclusion criteria were established, including current enrollment in the corresponding level, regular class attendance, and the signing of an informed consent form by legal guardians. Students with a clinical diagnosis of specific language disorder or moderate intellectual disability without specialized intervention were excluded from the study in order to preserve the homogeneity of the group in terms of neurolinguistic development.

The independent variable was phonological awareness, understood as the metalinguistic ability to reflect on the sound structure of language, including the recognition, segmentation, and manipulation of syllables, rhymes, and phonemes. This variable was operationalized through three dimensions: syllabic, intrasyllabic, and phonemic awareness. The dependent variables were reading skills (fluency, comprehension, accuracy) and writing skills (coherence, spelling, and textual structure). Intervening variables such as gender, age, socioeconomic status, frequency of reading and writing outside the classroom, teacher perception, and institutional availability of educational resources were also considered.

Data collection was carried out in three phases during the second quarter of the 2024-2025 school year. In the quantitative phase, the Phonological Awareness Test (TCF) was administered, originally developed by Mousty et al.⁽²²⁾ and adapted for Spanish-speaking contexts by Alegría and Domínguez.⁽²³⁾ This test assesses tasks such as identifying initial and final phonemes, syllable segmentation, phoneme deletion, and rhyme

recognition. To measure reading and writing skills, an adapted test from the Reading Processing Assessment Battery (BEPROLE) was administered, which includes reading comprehension exercises based on narrative and informative texts and written production through short writing tasks with standardized rubrics.⁽⁵⁾ The instruments were administered individually during two 45-minute sessions in appropriate spaces within the institution, ensuring standardized conditions and freedom from distractions.

In addition, a structured questionnaire with 22 items was designed to investigate reading and writing habits outside school hours, reading preferences, self-perception of performance, and knowledge of phonological awareness. This instrument was validated by expert judgment and administered collectively in the classroom under the direct supervision of the researchers. The internal consistency of the questionnaire was evaluated using Cronbach's alpha coefficient, obtaining acceptable reliability ($\alpha = 0,87$), a value that indicates high internal consistency of the items used.

In the second phase, which was qualitative in nature, semi-structured surveys were administered to language and literature teachers to explore the pedagogical strategies implemented, perceptions of the importance of phonological awareness, and institutional conditions for its integration into the curriculum. These surveys were complemented by in-depth interviews with five teachers and two institutional authorities, with the aim of identifying barriers, recurring practices, and assessment criteria used in the teaching of reading and writing. The interviews were recorded, transcribed, and analyzed using open thematic coding following the model of Miles, Huberman, and Saldaña.⁽²⁴⁾

Non-participant observations were also carried out in the classroom during language sessions, with the aim of recording teacher interactions, reading activities, resources used, and student responses to literacy-related tasks. These observations were carried out in eight consecutive sessions and were documented using a structured guide that allowed for subsequent triangulation with quantitative and qualitative data.

Descriptive and inferential statistical measures were used for statistical analysis. Frequencies, means, standard deviations, and percentages were calculated to describe the behavior of the variables. Subsequently, Pearson correlation analyses were applied to identify associations between phonological awareness and reading and writing performance variables, as well as Student's t-tests to compare groups according to gender and frequency of extracurricular reading. All quantitative analyses were processed using IBM SPSS Statistics version 25 software. ATLAS.ti version 9 software was used to process qualitative information, with inductive coding and progressive categorization.

The research complied with the ethical principles established in the Declaration of Helsinki and Ecuadorian national regulations for research in school settings. It was approved by the Ethics Committee of the State University of Milagro (code EDU-24-CFLEC) and had the institutional authorization of the educational institution. Informed consent was obtained from the legal representatives and verbal consent from the participating students. The confidentiality of the information, the exclusive use of the data for academic purposes, and the protection of the participants' identity were guaranteed at all times by assigning alphanumeric codes.

RESULTS

The quantitative analysis identified relevant patterns in the development of phonological awareness and its relationship with reading and writing skills in fifth-year students in Basic General Education. The sample analyzed, consisting of 50 participants, was evenly distributed by gender and had a mean age of 10,1 years ($SD = 0,6$). From a general perspective, 62 % of students had average levels of phonological awareness, while 24 % had high levels and 14 % had low levels. These results were consistent across different parallel classes and shifts, with no statistically significant differences by gender ($p > 0,05$), suggesting that phonological development at this stage is not conditioned by the student's biological sex.

In relation to reading skills, students obtained an overall average of 7,4 out of 10 in reading comprehension, with a standard deviation of 1,2. In terms of reading fluency—measured in words read correctly per minute—the average was 92,6 words, ranging from 70 to 115 words per minute. With regard to writing, the texts produced by the students were assessed according to criteria of coherence, spelling, and grammatical structure. Fifty-eight percent achieved an acceptable level of textual coherence, although recurring difficulties were identified in punctuation, idea segmentation, and the appropriate use of connectives and hyphen. In spelling, the most frequent errors were omission of complex spellings (such as “h” and “b-v”) and difficulties with accentuation.

Pearson's correlation analysis showed a moderate positive association between phonological awareness and reading performance ($r = 0,46$; $p < 0,01$). This correlation was more significant in the phonemic dimension, particularly in phoneme segmentation and deletion tasks, which showed a high correspondence with accuracy in reading complex words. Likewise, a positive correlation was found between phonological awareness and written production ($r = 0,41$; $p < 0,01$), especially in the areas of coherence and spelling. These findings reinforce the hypothesis that a higher level of phonological awareness is associated with better performance in both reading and writing, and are consistent with similar research in Spanish-speaking contexts.^(1,2)

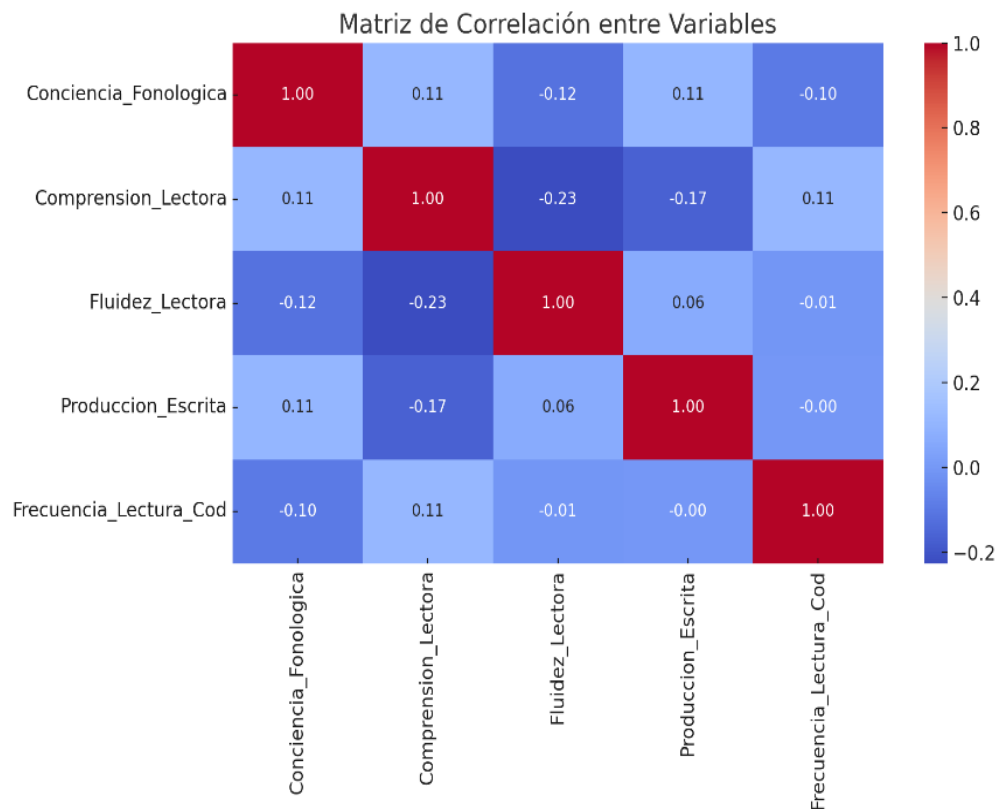


Figure 1. Correlation matrix between key variables

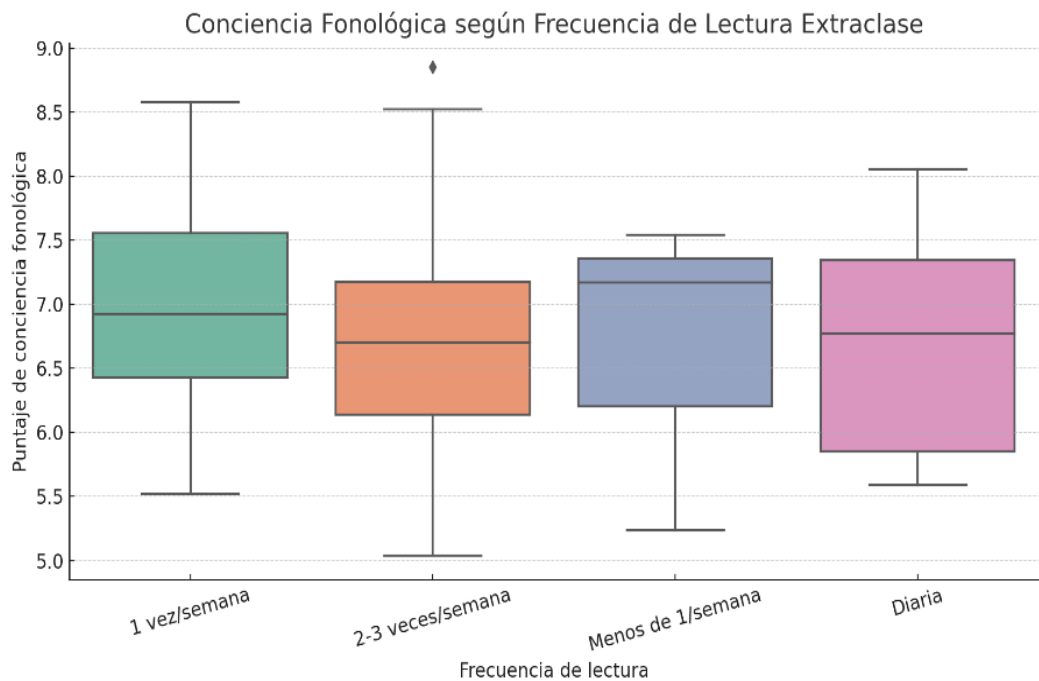


Figure 2. Comparison of phonological awareness according to reading frequency

Regarding reading and writing habits outside school hours, 54 % of students reported reading two to three times a week, while only 18 % reported reading daily. Reading preferences were mainly distributed between fiction books (36 %) and informal digital content such as social media (30 %). When contrasting the frequency of reading outside of class with the level of phonological awareness, a weak but significant correlation was identified ($r = 0,29$; $p < 0,05$), suggesting that students who maintain more consistent reading habits tend to develop phonological skills more effectively, although this relationship appears to be mediated by the quality of the material read and support at home.

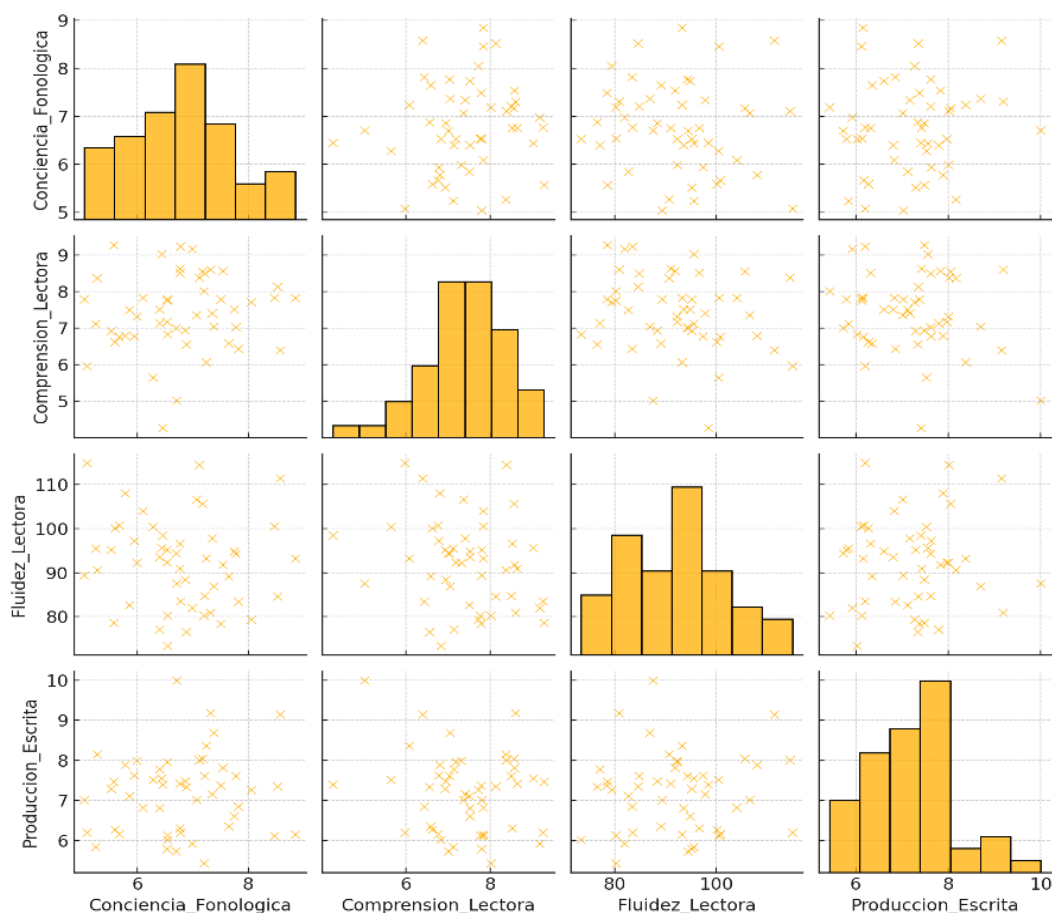


Figure 3. Matrix of significant correlations

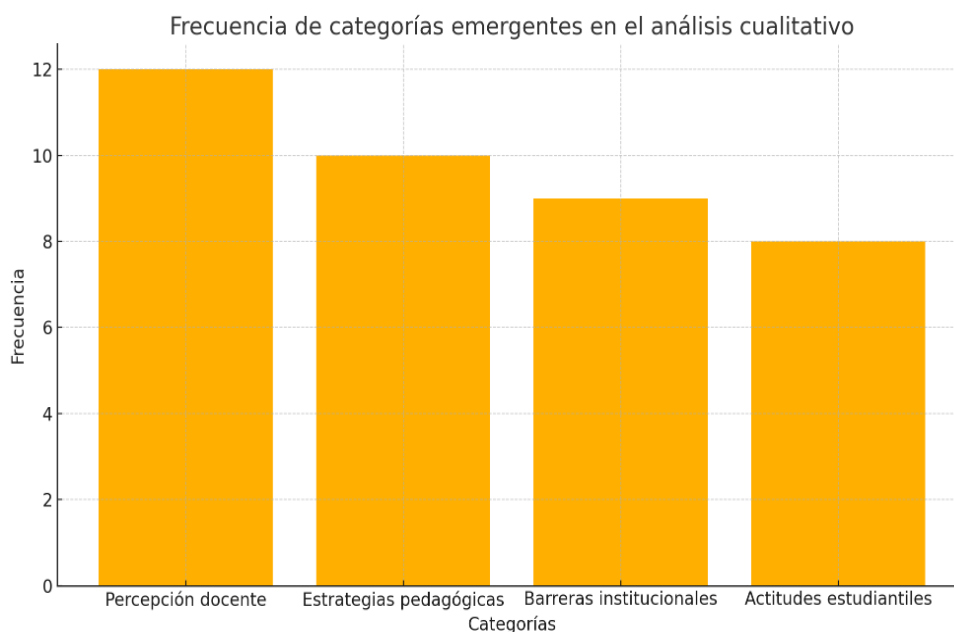


Figure 4. Importance of phonological awareness in the development of reading skills

In the qualitative domain, the teachers surveyed and interviewed mostly recognized the importance of phonological awareness in the development of reading and writing skills. However, only two of the five teachers said they systematically incorporated phonological exercises into their weekly planning. The most commonly used strategies were syllable segmentation, rhyming games, and phonetic spelling. However, these activities

were found to be poorly integrated into the curriculum and, in several cases, were applied intuitively and in an unstructured manner. The interviews also revealed that teachers recognize a training gap in this area, which prevents more effective and sustained intervention.

Classroom observations confirmed this trend. In 70 % of the sessions observed, no explicit activities aimed at developing phonological awareness were recorded. In cases where this skill was addressed, it was through incidental activities—such as repeating words in chorus or identifying initial sounds—but not as part of a pedagogical sequence with defined objectives. This lack of systematicity contrasts with the positive perception that teachers expressed in the questionnaires regarding the usefulness of phonological awareness, suggesting a disconnect between theory and practice in the educational environment.

From an institutional perspective, school administrators indicated that there are no clear policies or curriculum guidelines that promote the explicit teaching of phonological awareness. Although they recognize its importance, they mentioned that the curriculum load and lack of resources make it difficult to implement systematic phonological strategies. In this regard, there was evidence of a lack of coordination between institutional management, teacher training, and classroom teaching practices.

The results obtained through quantitative and qualitative analyses show a consistent relationship between the development of phonological awareness and students' reading and writing performance. However, this relationship is limited by contextual factors such as poor pedagogical systematization, lack of specific teacher training, and weak institutional support policies. These findings support the need to design comprehensive educational interventions that strengthen phonological development from a curricular, formative, and didactic perspective, articulating theory with practice to ensure effective and equitable literacy in vulnerable school settings.

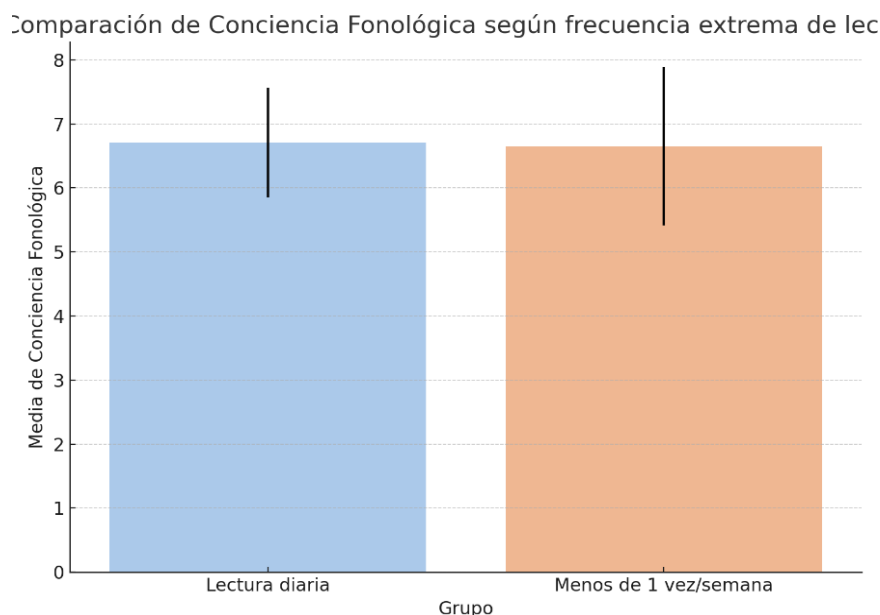


Figure 5. Comparison of phonological awareness according to external reading frequency

In order to explore whether the frequency of reading outside the classroom had a significant impact on phonological awareness levels, a one-factor ANOVA test was applied considering the four established groups: daily reading, 2-3 times per week, once per week, and less than once per week. The results indicated that there were no statistically significant differences between the groups ($F = 0,208$; $p = 0,890$), suggesting that reading frequency, evaluated in isolation, is not a sufficient differentiating factor to explain the level of phonological development among students.

To explore this relationship further, an independent samples t-test was conducted between the two extremes of reading behavior: students who reported reading daily and those who reported reading less than once a week. The results reaffirmed the absence of a significant difference in phonological awareness levels ($t = 0,075$; $p = 0,945$). Although graphically the daily reading group had a slightly higher mean, this difference did not reach statistical significance, which could be attributed both to the limited sample size and to the influence of uncontrolled intervening variables, such as the type of material read, the quality of family mediation, or the cognitive disposition of the students.

These tests provide relevant empirical evidence to understand that reading alone, without a structured pedagogical strategy and contextualized teaching support, may not have a significant effect on the development

of phonological awareness. This reinforces the need for comprehensive phonological intervention programs that go beyond promoting reading habits and include targeted language activities, the use of phonologically enriched material, and ongoing teacher training.

DISCUSSION

The results obtained in this study confirm that there is a significant relationship between phonological awareness and the development of reading and writing skills in fifth-grade students in basic general education. The correlations observed between phonological awareness and reading comprehension ($r = 0,46$), as well as between phonological awareness and written production ($r = 0,41$), are consistent with a broad base of empirical evidence that recognizes phonological awareness as a key predictor of reading and writing learning in the early stages of academic development.^(1,2)

These findings confirm previous studies indicating that phonological awareness, especially in its phonemic dimension, allows students to more easily access the alphabetic principle and decode words efficiently, which directly impacts their reading comprehension.^(13,14) Recent research, such as that by Jiménez and O'Shanahan⁽²⁵⁾, has shown that structured interventions based on phonological awareness significantly improve reading fluency and comprehension in Spanish-speaking students, even in socioeconomically disadvantaged contexts.⁽⁵⁾ Similarly, authors such as Bravo-Valdivieso et al.⁽²⁶⁾ argue that phonological development has lasting effects on spelling acquisition and coherent writing, especially when accompanied by systematic and explicit instruction.

However, one of the most relevant findings of the present study is the lack of statistical significance between the frequency of extracurricular reading and levels of phonological awareness, both in the analysis of variance (ANOVA) and in the Student's t-test. Although a slight trend in favor of those who read more frequently was identified, this difference was not sufficient to establish a robust causal relationship. This result is revealing, as it questions the widespread assumption that independent reading alone is sufficient to develop phonological skills. In fact, recent literature suggests that the impact of reading on phonological development is mediated by variables such as text type, the quality of adult support, the linguistic richness of the material, and the student's motivation to read.^(7,8)

In this regard, studies by Dehaene⁽²⁷⁾ and Goswami⁽²⁸⁾ emphasize that phonological awareness does not develop spontaneously but requires explicit, repetitive, and multisensory instruction, especially in children who have not been exposed to phoneme-rich language practices and segmented speech structures since early childhood.^(9,10) Therefore, the finding that teachers recognize the importance of phonological awareness but do not systematically incorporate it into their planning points to a critical disconnect between theory and practice, which weakens the impact of early literacy policies.

Furthermore, classroom observations reinforce this hypothesis. Although students regularly participate in reading and writing activities, these are not always designed with a structured phonological approach. The use of rhymes, syllable segmentation, and phonemic activities remains limited and, in many cases, is the result of individual teacher initiatives rather than institutional pedagogical policy. This pattern has also been observed in other Latin American educational contexts, where the development of metalinguistic skills has not been systematically incorporated into official basic education curricula.⁽²⁹⁾

Given this scenario, it is essential to propose sustainable educational interventions that strengthen the link between phonological awareness and literacy, taking into account the linguistic and cultural diversity of students. First, we recommend the implementation of school programs that integrate daily phonological routines from the first cycle of basic general education, coordinated with the areas of language and literature. These programs should be based on scientific evidence and designed with a progressive approach that advances from syllabic awareness to phonemic awareness.^(30,31)

Second, we propose ongoing training for teachers in phonological teaching methods based on neuroscience and active pedagogy. Research suggests that when teachers understand the cognitive basis of phonological awareness and have appropriate methodological resources, they significantly improve their students' reading and writing outcomes.

Third, it is recommended that the family environment be strengthened as a space for linguistic stimulation. Shared reading, playing with sounds, creative oral expression, and spontaneous storytelling are strategies that, combined with formal schooling, can optimize phonological development from early childhood. Several studies have confirmed that active family involvement in early literacy practices has positive effects on later academic performance.^(32,33,34,35)

Finally, a review of the curriculum at the institutional and ministerial levels is recommended, incorporating specific indicators of phonological awareness into learning assessments and establishing clear guidelines for their implementation. This perspective should be complemented by an evaluation of available teaching resources, ensuring that schools have phonologically appropriate teaching materials (syllabic books, phoneme cards, sound games) and technical support for their effective use.

From a critical perspective, this study reaffirms that reading and writing development requires an integrated

approach, articulating explicit phonological routines, planned teaching interventions, and a family and school environment rich in linguistic experiences.

Implement structured phonological programs from the earliest levels of basic education, with a progressive approach from syllabic awareness to phonemic awareness. These programs should be aligned with the national curriculum and have adequate teaching resources.

Provide ongoing training for teachers in the use of effective phonological strategies, supported by scientific evidence and based on neuroeducational principles. Training should include multisensory practices, diagnostic tools, and planning by levels of phonological awareness.

Promote school policies that integrate phonological awareness as a cross-cutting theme in language and literature, complemented by regular formative assessments to monitor students' phonological progress.

Strengthen the family environment as a space for phonological stimulation, promoting shared reading, sound play, and oral storytelling from preschool onwards. Schools should organize workshops with parents to raise awareness of the importance of these habits.

Ensure equitable access to phonologically enriched materials, both print and digital, in school and community libraries. It is essential that texts be designed or selected considering the syllabic and phonemic structure of Spanish.

Incorporate phonological awareness as an assessment and monitoring indicator in national education policies, recognizing it as a key competency in fundamental learning for the 21st century.

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None.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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