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Review article

Caregivers' health literacy regarding child health promotion: a bibliometric study

Letramento em saúde de cuidadores sobre a promoção da saúde de crianças: estudo bibliométrico

Alfabetización en salud de cuidadores para la promoción de la salud infantil: estudio bibliométrico

Lúvia Santos da Silva[I], Eliza Paixão da Silva[I], Erlon Gabriel Rego de Andrade[I], Ivaneide Leal Ataíde Rodrigues[I], Alexandre Aguiar Pereira[I], Laura Maria Vidal Nogueira[I]

[I] Universidade do Estado do Pará/UEPA, Belém, Pará, Brazil

Abstract

Objective: to measure the scientific production on caregivers' health literacy regarding the promotion of children's health. **Method:** a bibliometric study associated with *Methodi Ordinatio*. Search strategies were developed for five national and international databases using descriptors/keywords combined with Boolean operators. Data analysis was performed using three bibliometric laws (Lotka's, Bradford's, and Zipf's laws) and the *In Ordinatio* equation. **Results:** among the 722 articles identified, those published in 2021 and 2024 in English predominated. A total of 3,838 authors were identified, with different levels of productivity and collaboration; 341 journals were identified, of which 14 (4.1%) constituted Bradford's core, accounting for 236 articles (32.7%); 4,541 keywords were cited 22,241 times, of which 28 (0.6%) constituted the trivial zone, accounting for 6,949 citations (31.2%). *Methodi Ordinatio* was applied to 13 articles. **Conclusion:** despite the considerable volume of studies on the topic, only a few are considered to have high bibliometric relevance.
Descriptors: Caregivers; Child; Health Literacy; Health Promotion; Bibliometrics

Resumo

Objetivo: mensurar a produção científica em torno do letramento em saúde de cuidadores sobre a promoção da saúde de crianças. **Método:** estudo bibliométrico associado à *Methodi Ordinatio*. Construíram-se expressões de busca para cinco bases de dados com abrangência nacional/internacional, utilizando descritores/palavras-chave associados com operadores booleanos. Para análise de dados, foram aplicadas três leis bibliométricas (de Lotka, de Bradford e de Zipf) e a equação *In Ordinatio*. **Resultados:** entre 722 artigos, prevaleceram os publicados em 2021 e 2024 no idioma inglês. Foram identificados: 3.838 autores com diferentes números de produção e níveis de colaboração; 341 periódicos, dos quais 14 (4,1%) constituíram o núcleo de Bradford, com 236 artigos (32,7%); 4.541 palavras-chave citadas 22.241 vezes, das quais 28 (0,6%) constituíram a zona trivial, com 6.949 citações (31,2%). Aplicou-se a *Methodi Ordinatio* com 13

artigos. **Conclusão:** apesar do interessante volume de estudos sobre o tema, poucos ainda são considerados de grande relevância bibliométrica.
Descritores: Cuidadores; Criança; Literacia para a Saúde; Promoção da Saúde; Bibliometria

Resumen

Objetivo: medir la producción científica sobre la alfabetización en salud de los cuidadores para la promoción de la salud infantil. **Método:** estudio bibliométrico asociado a la *Methodi Ordinatio*. Se construyeron estrategias de búsqueda para cinco bases de datos de alcance nacional e internacional, utilizando descriptores/palabras clave combinados con operadores booleanos. Para el análisis de los datos, se aplicaron tres leyes bibliométricas (Ley de Lotka, Ley de Bradford y Ley de Zipf) y la ecuación *In Ordinatio*. **Resultados:** entre los 722 artículos, predominaron los publicados en 2021 y 2024 en idioma inglés. Se identificaron 3.838 autores con diferentes niveles de productividad y colaboración; 341 revistas, de las cuales 14 (4,1%) constituyeron el núcleo de Bradford, con 236 artículos (32,7%); y 4.541 palabras clave citadas 22.241 veces, de las cuales 28 (0,6%) constituyeron la zona trivial, con 6.949 ocurrencias (31,2%). Se aplicó la *Methodi Ordinatio* a 13 artículos. **Conclusión:** a pesar del considerable volumen de estudios sobre el tema, pocos aún se consideran de alta relevancia bibliométrica.
Descriptores: Cuidadores; Niño; Alfabetización en Salud; Promoción de la Salud; Bibliometría

Introduction

Health literacy (HL) is defined as an individual's ability to read, understand, and apply written or verbal health information required to make decisions aimed at achieving positive health outcomes. It involves acquiring specific skills to perform daily activities and tasks related to health promotion and disease or illness prevention and enables individuals to make choices that improve their health conditions.[1]

The expression "HL" was originally used by Dixon in the United States of America in 1959. Since the late 1990s, and more markedly from the 2000s onward, studies on HL have expanded worldwide to understand how skills and competencies may influence individual and collective health outcomes.[2]

It is estimated that inadequate HL adds approximately US$106.238 million to healthcare system costs, representing between 7% and 17% of all personal healthcare expenditures.[3] Although low HL affects people from different social strata, it disproportionately affects more vulnerable populations due to the social, economic, political, geographical, and historical conditions to which they have been or continue to be exposed, placing them at a disadvantage concerning access to and utilization of healthcare services.[4]

Actions and strategies aimed at improving the HL of parents and caregivers have positive effects on children's health status and health-related behaviors and may contribute, in the long term, to reducing health inequalities. Social determinants directly influence the health-disease process throughout the life course, especially among children and adolescents, who are in stages of growth and development.[5]

HL is widely recognized as essential to children's health and quality of life, since child health depends on parents' ability to care for and understand their children's care needs. Parents with inadequate HL are more likely to seek healthcare services for their children and demonstrate poorer performance in providing care.[6] National and international studies have shown that caregivers play a fundamental role in providing high-quality support to children. Children who do not receive adequate care are more susceptible to illness, which compromises their growth and development.[7-8] Thus, parents' ways of thinking and acting influence the care provided to their children. Culture and the social relationships mediated by it affect both parental knowledge and caregiving practices.

The 2030 Agenda Sustainable Development Goals (SDGs), proposed by the United Nations, establish that improving children's quality of life is one of the goals to be achieved. These goals seek to promote social protection and well-being, ensure equitable access for all children, and prevent preventable childhood mortality during early childhood.[9]

The Brazilian National Policy for Comprehensive Child Health Care highlights the priority of actions targeting children and adolescents living in socially vulnerable communities. These actions should provide comprehensive and continuous care through healthcare services in accordance with the Unified Health System principles and guidelines.[10] Among the proposed actions are immunization, the promotion of breastfeeding and healthy eating, monitoring of growth and development, home visits, and continuity of care. These actions go beyond ensuring survival and observing or measuring children's biological aspects, prioritizing child health surveillance and health promotion to support their full biopsychosocial development.[11]

Commonly associated with low educational attainment, insufficient HL among parents affects the quality of care provided to children, which, in turn, influences child development by creating difficulties in understanding health-related information, such as medication dosage, the correct method of administration, and duration of action. This limited understanding results in poor adherence to professional recommendations, contributing to gaps in care, high rates of obesity, poor oral health conditions, and an increased number of hospital admissions.[6]

Therefore, it is essential for healthcare teams to provide caregivers with appropriate guidance on aspects such as growth, neuropsychomotor development, immunization, nutrition, and disease prevention, thereby helping to reduce morbidity and mortality before children reach their first year of life.[11] It is important to emphasize that conditions such as malnutrition, neglect, and violence threaten child development, particularly during early childhood. For this reason, investing in this stage of life is essential to achieve positive outcomes not only for children but also for their families and society.[12]

HL is strongly influenced by the context in which individuals live. Evidence of this can be observed in communities with high social vulnerability, where, in addition to the limitations inherent to HL and access to healthcare services, there are concerning scenarios characterized by high morbidity and mortality rates. The relationship between HL and the social context underscores the importance of strategies that promote education and community engagement to improve population health.[13]

Given the relevance of studies addressing caregivers' HL regarding the promotion of children's health, this study is justified by its contribution to updated knowledge on the need to include the assessment of caregivers' HL as a priority in public policies, with the aim of improving not only children's health outcomes but also those of the caregivers themselves.[14]

From this perspective, bibliometrics makes it possible to identify the quantitative indicators of scientific production on a specific topic, facilitating the generation and dissemination of knowledge. This field emerged from the need to investigate and characterize academic publications by using statistical and mathematical methods to objectively assess scientific output.[15]

Furthermore, the presentation of evidence may broaden understanding of the importance of caregivers in making informed and responsible decisions regarding child care, thereby guiding interventions that support caregivers in interacting with children in ways that help them achieve their full developmental potential during early childhood.[6]

Accordingly, this study aimed to measure the scientific production on caregivers' health literacy regarding the promotion of children's health.

Method

This was a descriptive bibliometric study using the *Methodi Ordinatio* approach, conducted by graduate students and faculty members from the Graduate Program in Nursing at a public university located in Belém, Pará, Brazil. Bibliometrics was selected because it enables quantitative analyses based on indicators of scientific production and knowledge dissemination. Its purpose is to support the synthesis of information available across multiple databases and to map studies on a specific topic within areas of interest to scientific research.[16]

Methodi Ordinatio is designed to optimize the identification of relevant studies by ranking articles according to journal impact factor, publication year, and citation count. By providing a clear methodological framework for assessing scientific production, this approach enhances objectivity and transparency in the selection process while reducing the risk of bias and analytical gaps, a fundamental characteristic for the reliability of bibliometric studies.[17]

The PICo framework[18-19] was used, in which the P element refers to the population, for which the descriptor "Child Care" was selected; the I element refers to the phenomenon of interest, for which the descriptor "Health Literacy" and the keyword "Health Literacy" were selected; and the Co element refers to the context, for which the descriptor "Child Health" and the keywords "Child Care" and "Care for

Children" were selected. Based on this framework, the following guiding research question was formulated: what is the current landscape of the scientific literature on caregivers' HL regarding the promotion of children's health?

Indexed as exact descriptors or alternative terms (considered keywords) on the Health Sciences Descriptors (DeCS – *Descritores em Ciências da Saúde*) website, these terms were used in Portuguese, English, and Spanish to develop the search strategies using the Boolean operators AND and OR. Five databases were searched: Latin American and Caribbean Health Sciences Literature (LILACS), *Banco de Dados em Enfermagem* (BDENF), and Medical Literature Analysis and Retrieval System Online (MEDLINE) through the Virtual Health Library (VHL); and Scopus and Web of Science (WoS) through the Coordination for the Improvement of Higher Education Personnel (CAPES – *Coordenação de Aperfeiçoamento de Pessoal de Nível Superior*) Journal Portal of the Brazilian Ministry of Education, accessed via institutional registration through the *Comunidade Acadêmica Federada*.

After preliminary searches, it was found that incorporating three blocks to formulate the search strategies, with terms representing the three elements of the PICo framework, would overly restrict the search and limit the inclusion of potentially relevant studies in this review. Therefore, the third block, corresponding to the context, was excluded, and the descriptors and keywords were allocated to the first and second blocks of the search strategies. Accordingly, the search strategy used in the VHL was: ((“*Cuidado da Criança*” OR “Child Care” OR “*Cuidado de Los Niños*” OR “*Saúde da Criança*” OR “Child Health” OR “*Salud Infantil*” OR “*Cuidado Infantil*” OR “*Cuidado à Criança*”) AND (“*Letramento em Saúde*” OR “Health Literacy” OR “*Alfabetización en Salud*” OR “*Literacia em Saúde*”)). For Scopus and WoS, the search strategy was: ((“Child Care” OR “Child Health”) AND (“Health Literacy”)).

The final searches were conducted during the third week of January 2025 and included original research articles published between January 2014 and December 2024 that addressed the study topic, with no language restrictions. This time frame was selected because HL studies have gained greater prominence during the 21st century, emerging as a growing field of research. By covering a complete 11-year period, the review sought to identify a sufficient number of studies to achieve its

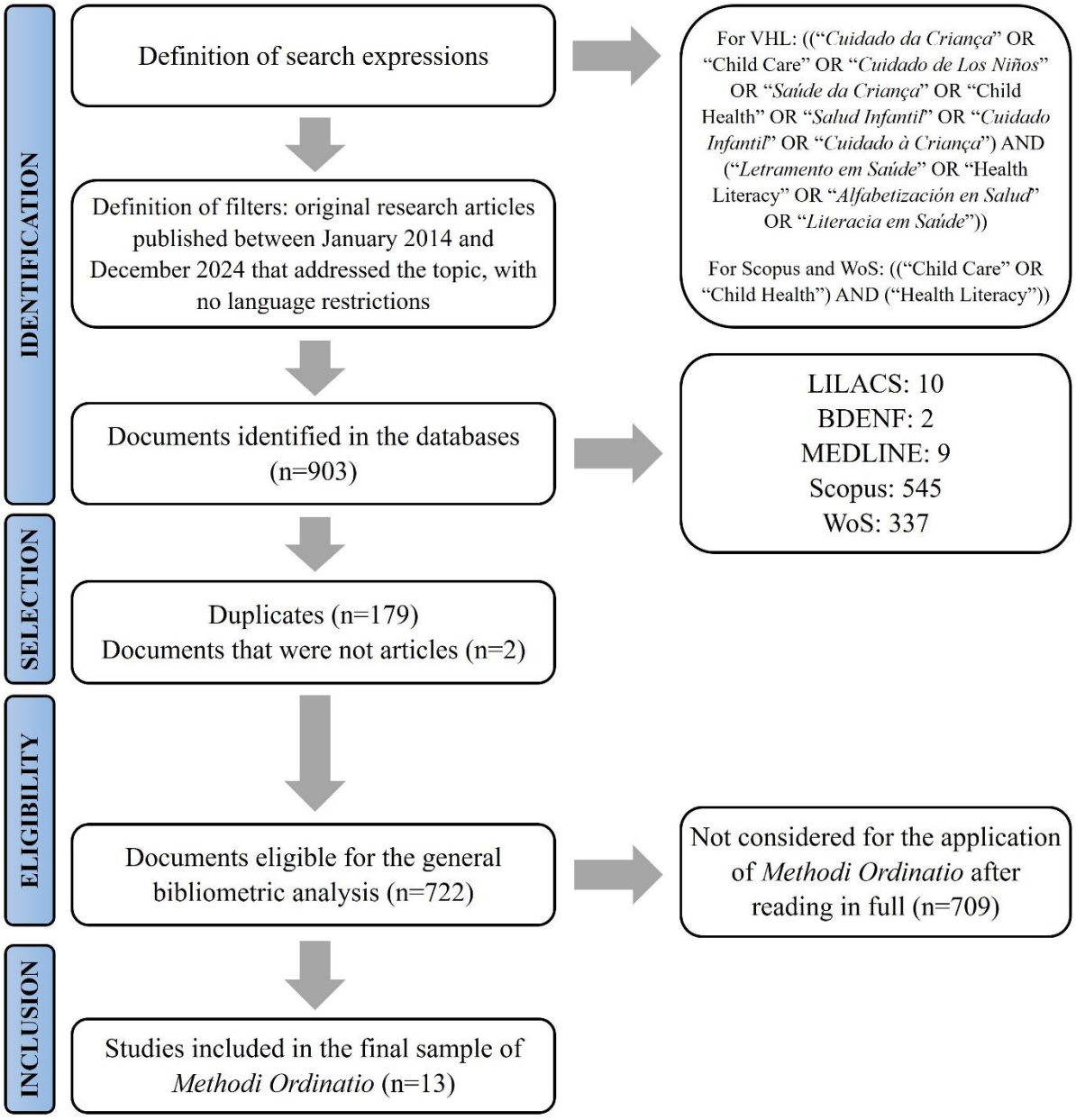
objective. Articles without free full-text access were excluded, even after attempts to obtain them through multiple sources, including databases and institutional repositories. Undergraduate and graduate academic works (monographs, master's dissertations, and doctoral theses), books, book chapters, and conference proceedings were also excluded.

A total of 903 records were initially identified, including 10 from LILACS, two from BDENF, nine from MEDLINE, 545 from Scopus, and 337 from WoS. The bibliographic records were imported into the Rayyan® application (free version, 2024, Qatar Computing Research Institute, Doha, Qatar) in Research Information Systems format. This application assists researchers in screening, organizing, and selecting scientific articles, thereby optimizing literature reviews. A total of 179 duplicate records were removed (retaining only one copy of each), and two documents that were not research articles (one conference abstract and one undergraduate monograph) were excluded, resulting in 722 records.

Titles and abstracts were screened using Rayyan®'s blind feature, which allows each reviewer to perform the selection process independently. All 722 records addressed different aspects related to the study topic and were therefore included in the overall bibliometric analysis. After full-text assessment, 13 articles were identified as specifically investigating caregivers' HL regarding the promotion of children's health and were therefore included in the final sample for application of *Methodi Ordinatio*, as illustrated in the selection flowchart (Figure 1).

Using these 13 articles, data were collected with an adapted characterization instrument.[20] The selected variables included study identification (authors, year of publication, title, journal, database, country, language, and objectives), methodological characteristics (study design/approach and sample), and additional characteristics (participants' age/sex, results, and the HL instruments used in the studies).

Figure 1 – Article selection flowchart. Brazil, 2025



The 722 articles were exported to a Microsoft Office Excel® spreadsheet (version 2019, Microsoft Corporation, Washington, United States), enabling descriptive statistical analysis of five variables: publication year, language, authors, journals, and indexing terms (descriptors or keywords, hereafter uniformly referred to as "keywords" to improve the flow of the text). For the variables "authors", "journals", and "indexing terms", Lotka's Law, Bradford's Law, and Zipf's Law were applied, respectively.

Lotka's Law analyzes author productivity within a field of knowledge. According to this law, the number of authors publishing n papers is proportional to $1/n^2$ in relation to the number of authors publishing only one paper; therefore, it is also known as the Inverse Square Law.[15,21] To apply this law, authors were arranged in descending order according to their scientific production to identify the number of articles published by each author, following the theoretical logic of the Inverse Square Law. However, in the empirical context, the results did not mathematically correspond to this theoretical distribution, as also demonstrated in another study.[21] Nevertheless, the essence of the law was preserved, since the findings showed that most authors contributed a small number of publications, whereas a minority accounted for a substantial proportion of the scientific output.[22]

The VOSviewer® software (version 1.6.16, Centre for Science and Technology Studies, Leiden University, the Netherlands) was used to identify co-authorship networks, defined as collaborations between two or more authors within the same publication. This software constructs collaboration networks, making it possible to identify research groups and analyze collaborative relationships.[23]

Bradford's Law was used to identify the journals that are most relevant to specific fields or topics. According to this law, journals are distributed into three zones: the first, also known as the Bradford core, consists of a small number of journals with the highest publication output; the second generally includes a larger number of journals than the core but with fewer publications; and the third tends to comprise many journals, each responsible for publishing only a few articles.[24] To apply this law, journals were arranged in descending order according to the number of publications, and the total number of articles was divided by three so that each zone contained approximately one-third (33.33%) of the scientific production.[25] Additionally, the Bradford multiplier (Bm) was calculated using the formula $Bm = Pn/Pn-1$, where Pn corresponds to the number of journals in a given zone and Pn−1 corresponds to the number of journals in the preceding zone.[15]

Zipf's Law describes the frequency and distribution of words within a text or a set of texts. In the present study, the analysis focused on keywords, which were classified into three distinct zones: the first, referred to as the trivial zone, comprised the most frequent

keywords; the second, referred to as the interesting zone, included keywords that occurred less frequently than those in the first zone; and the third, referred to as the noise zone, consisted of keywords cited only sporadically.[26]

To apply this law, the keywords were arranged in descending order according to their frequency of occurrence, using mathematical nth values and considering the absolute frequencies, following the procedure adopted in a previous study.[26] Thus, the interval between the frequency of the most frequent keyword (illustratively referred to as value "A") and one-tenth of that value (value "B") defined the first zone. The interval between value "B" and one-tenth of that value (value "C") defined the second zone, whereas the interval between value "C" and one-tenth of that value (value "D") defined the third zone. To facilitate readers' understanding of the method, these values were identified using uppercase letters of the alphabet (A, B, C, and D).

After applying the bibliometric laws, *Methodi Ordinatio* was applied to the 13 articles comprising the final sample. This method selects and ranks articles according to their scientific relevance based on analytical criteria such as journal impact factor, year of publication, and citation count. It consists of nine stages: (1) defining the research question; (2) conducting a preliminary search; (3) defining the search terms and their combinations; (4) performing the final database search; (5) filtering the publications; (6) identifying the journals' impact factors, publication years, and article citation counts; (7) applying the *In Ordinatio* equation; (8) locating and downloading the full-text articles; and (9) systematically reading and analyzing the selected articles.[27] The first five stages were described in the previous paragraphs.

In the sixth stage, publication years and citation counts were obtained using Google Scholar, a digital platform that indexes a broad collection of scientific publications.[28] Journal impact factors were identified through the 2023 Journal Citation Reports (JCR), produced by Clarivate Analytics and accessed through the CAPES Journal Portal, which provides statistical indicators on the relevance and impact of scientific journals within the research community.[29]

The seventh stage consisted of ranking the articles according to their scientific relevance. This ranking was determined using the *In Ordinatio* equation, expressed as *In Ordinatio*=(1000IF)+(α×(10−(Research Year−Publish Year)+(Ci))), where IF is the

journal impact factor; α is the importance value assigned to the article, ranging from 1 to 10; Research Year is the year in which the study was conducted; Publish Year is the year in which the article was published; and Ci is the number of citations recorded in Google Scholar.[27]

It should be noted that, at the time the *In Ordinatio* equation was applied, the eighth stage had already been completed through the retrieval and download of the full-text versions of the selected articles from the websites of the respective journals in which they had been published. In relation to the systematic reading, the ninth stage enabled a critical assessment of the relevant information contained in the 13 selected articles.

It is important to emphasize that bibliometric laws should be applied to a large body of publications to enable the identification of general patterns, such as author productivity, journal relevance, and word frequency and distribution.[30] Therefore, all 722 articles were included in the application of the bibliometric laws.

Methodi Ordinatio was applied only to the sample of 13 articles because these were considered the most closely aligned with the PICo framework. A similar procedure was adopted in a study investigating the profile of scientific production related to the development, validation, and application of nursing technologies, published in a well-established journal in the field. In that study, the bibliometric laws were applied to 222 articles. After screening titles and abstracts, 196 articles were excluded, resulting in a final sample of 26 articles that comprised the bibliographic portfolio analyzed using *Methodi Ordinatio*.[31]

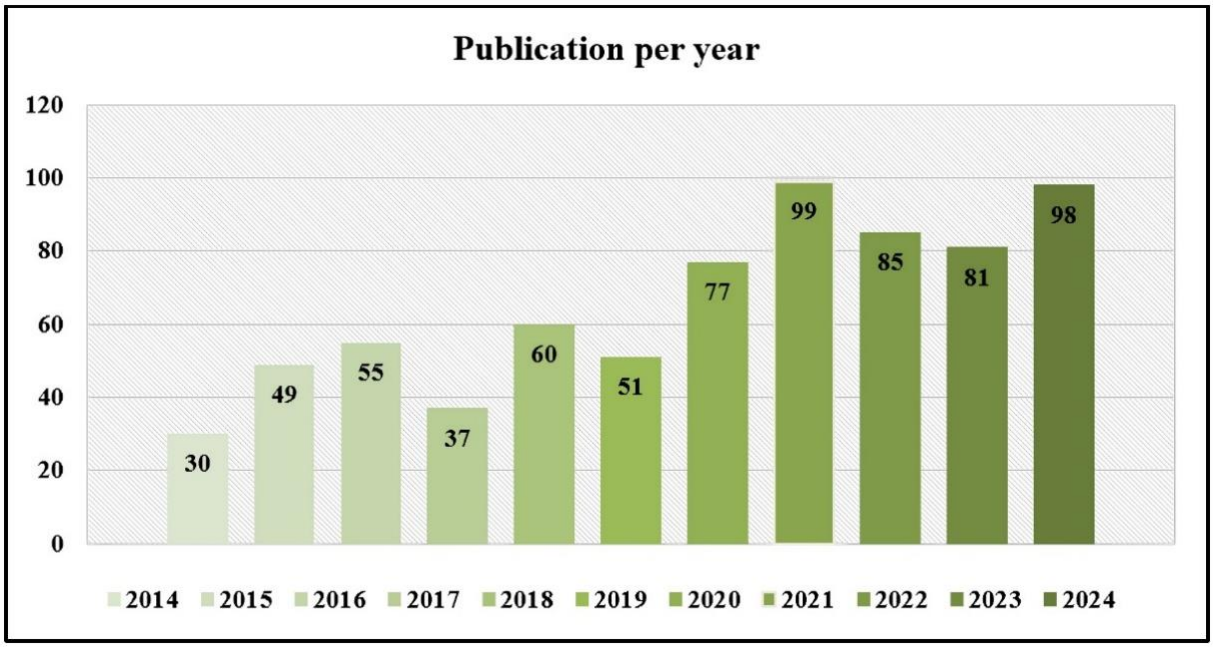
Since this was a review study, approval by a Research Ethics Committee was not required. Furthermore, it is important to emphasize that the data extracted from the included articles are consistent with those originally published by their respective authors.

Results

Among the general characteristics of the 722 articles, most were published in 2021 (n=99; 13.7%) and 2024 (n=98; 13.6%). A decline in the number of publications was observed in two subsequent years (n=85; 11.8% in 2022 and n=81; 11.2% in 2023). The lowest number of publications was identified in 2014 (n=30; 4.2%), as shown in Figure 2.

In terms of language, English predominated (n=693; 96.0%), followed by Chinese (n=12; 1.7%), German (n=6; 0.8%), Portuguese (n=4; 0.6%), Persian and Turkish (n=2; 0.3% each), and Spanish, French, and Russian (n=1; 0.1% each).

Figure 2 – Years of article publication. Brazil, 2025

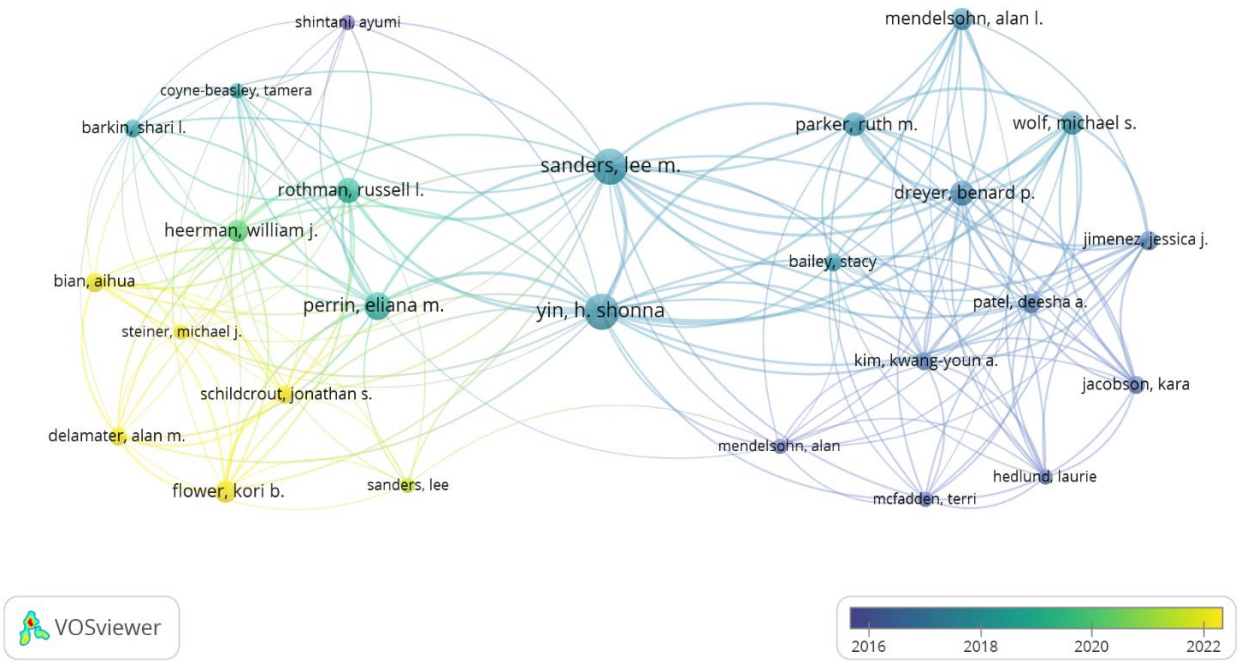


Application of Lotka's Law identified a total of 3,838 authors, of whom 3,479 (90.6%) published only one article; 252 (6.6%) published two articles; 56 (1.5%) published three articles; 26 (0.7%) published four articles; nine (0.2%) published five articles; five (0.1%) published six articles; three (0.1%) published seven articles; one (<0.1%) published eight articles; four (0.1%) published nine articles; one (<0.1%) published 10 articles; and one (<0.1%) published 17 articles. One author (<0.1%) was responsible for 20 publications. These findings indicate that a small number of authors published more frequently than the majority.

The analysis of co-authorship networks demonstrated the collaborative relationships among the leading authors over time. Generated using the VOSviewer® software, Figure 3 illustrates these networks, highlighting two main production groups (clusters). The authors with the highest number of publications are located at the center of the network, connecting both clusters. One author (Sanders, LM) published 20 articles, whereas another (Yin, HS) published 17, and collaborative relationships

were identified between them. The color scale represents the publication years of the articles, distinguishing different groups of authors.

Figure 3 – Co-authorship networks of the articles, including the most cited authors, according to VOSviewer® software. Brazil, 2025



Based on Bradford's Law, a total of 341 journals were identified and organized into three zones according to their productivity. The first zone, or Bradford core, comprised 14 journals (4.1%), which accounted for 236 articles (32.7%). The second zone comprised 86 journals (25.2%), which accounted for 243 articles (33.7%). The third zone comprised 241 journals (70.7%), which also accounted for 243 articles (33.7%). The Bm between the second zone and the Bradford core was approximately 6.1, whereas the Bm between the third and second zones was approximately 2.8. Considering the representativeness of the first 14 journals, they were highlighted in Table 1.

Table 1 – Productivity of journals in the Bradford core. Brazil, 2025

Nº	Journals (n=14)	IF*	Articles (n=236)
1	International Journal of Environmental Research and Public Health†	4.614	49
2	Maternal and Child Health Journal	1.800	26
3	BMJ Open	2.400	25
4	PLoS ONE	2.900	24
5	Pediatrics	6.200	21
6	BMC Public Health	3.500	16
7	Journal of Child Health Care	1.300	13
8	Academic Pediatrics	3.000	13
9	Health Promotion International	2.300	11
10	Child Care Health and Development	1.800	9
11	Journal of Pediatrics	3.900	8
12	BMC Pediatrics	2.000	7
13	Frontiers in Public Health	3.000	7
14	BMC Pregnancy and Childbirth	2.800	7

Legend: *IF – impact factor from the 2023 Journal Citation Reports; †journal with a most recent impact factor from 2021

Application of Zipf's Law identified 4,541 keywords, cited a total of 22,241 times across the 722 articles. These keywords were distributed into three zones as follows: the trivial zone, comprising 28 keywords (0.6%) with 6,949 occurrences (31.2%); the interesting zone, comprising 306 keywords (6.7%) with 7,226 occurrences (32.5%); and the noise zone, comprising 4,207 keywords (92.6%) with 8,066 occurrences (36.3%).

Because of their representativeness, the keywords included in the trivial zone, together with their respective absolute and relative frequencies, are highlighted: "health literacy" (n=886; 4.0%); "female" (n=641; 2.9%); "child" (n=611; 2.7%); "human" (n=474; 2.1%); "male" (n=444; 2.0%); "humans" (n=391; 1.8%); "article" (n=362; 1.6%); "adult" (n=357; 1.6%); "child health" (n=326; 1.5%); "adolescent" (n=242; 1.1%); "infant" (n=191; 0.9%); "pregnancy" (n=154; 0.7%); "questionnaire" (n=147; 0.7%); "cross-sectional study" (n=143; 0.6%); "controlled study" (n=136; 0.6%); "health promotion" (n=132; 0.6%); "parents" and "health education" (n=131; 0.6% each); "major clinical study" (n=124; 0.6%); "preschool child" (n=119; 0.5%); "young adult" and "cross-sectional studies" (n=109; 0.5% each); "child preschool" (n=106; 0.5%); "qualitative research" (n=103; 0.5%); "psychology" (n=98; 0.4%); "surveys and questionnaires"

(n=97; 0.4%); "attitude to health" (n=94; 0.4%) and "child parent relation" (n=91; 0.4%).

The 13 articles selected for *Methodi Ordinatio* were organized in descending order according to their *In Ordinatio* scores and are presented in Chart 1.

Chart 1 – Synthesis of the 13 articles and application of *Methodi Ordinatio*. Brazil, 2025

N°	Title	Author(s) and year	IF*	Ci†	*In ordinatio*	Journal	Objective
1	Parental health literacy and health knowledge, behaviours and outcomes in children: a cross-sectional survey	Buhr; Tannen (2020)[32]	3.500	166	211.0035	BMC Public Health	Investigate parental health literacy and its implications for children's health behaviors and outcomes.
2	Association between maternal health literacy and child vaccination in India: a cross-sectional study	Johri *et al*. (2015)[33]	4.900	144	164.0049	Journal of Epidemiology and Community Health	Investigate the relationship between maternal health literacy and childhood vaccination in two disadvantaged communities in India.
3	Exploring the relationship between maternal health literacy, parenting self-efficacy, and early parenting practices among low-income mothers with infants	Lee *et al*. (2018)[34]	1.200	58	93.0012	Journal of Health Care for the Poor and Underserved	Analyze how maternal health literacy and parental self-efficacy influence caregiving practices during the baby's first months of life.
4	Infant sleep and parent health literacy	Bathory *et al*. (2016)[35]	3.000	61	86.0030	Academic Pediatrics	Investigate how parental health literacy relates to aspects of child sleep, such as the presence of a TV in the bedroom, sleep regularity, and sleep duration.
5	Association	Fong *et al*.	3.900	50	85.0039	Journal of	Investigate the relationship

	between health literacy and parental self-efficacy among parents of newborn children	(2018)[36]				Pediatrics	between health literacy and parental self-efficacy among parents of newborns.
6	Parents' functional health literacy is associated with children's health outcomes: implications for health practice, policy, and research	Lee *et al*. (2020)[37]	2.400	32	77.0024	Children and Youth Services Review	Demonstrate how parents' functional health literacy influences children's health outcomes, considering differences across racial/ethnic groups.
7	Relations of maternal health literacy and parenting practices with early childhood development: a cross-sectional study	Oflu; Yalçin (2024)[38]	2.200	9	74.0022	International Journal of Environmental Health Research	Examine the relationships between early childhood development, maternal health literacy, and mothers' early parenting practices.
8	The sociodemographic determinants of health literacy in the ethnic Hungarian mothers of young children in Eastern Europe	Sántha (2021)[39]	4.614	23	73.0046	International Journal of Environmental Research and Public Health‡	Investigate the sociodemographic determinants of health literacy among ethnic Hungarian mothers of young children in Eastern Europe.
9	Health literacy and nutrition literacy among mother with preschool children: what factors are effective?	Ahmadi; Karamitanha (2023)[40]	2.500	12	72.0025	Preventive Medicine Reports	Determine health literacy and nutritional literacy levels among mothers of preschool-aged children.
10	Health literacy and parent	Liechty; Saltzman;	4.600	51	71.0046	Appetite	Describe parents' preferences regarding

	attitudes about weight control for children	Musaad (2015)[41]					information-seeking and strategies for managing their child's weight, considering the influence of their health literacy levels.
11	Health literacy of parents and carers in a regional community: a cross-sectional study	Leach *et al*. (2023)[42]	0.900	5	65.0009	Community Health Equity Research & Policy	Assess the level of health knowledge among parents/caregivers in a regional Australian community.
12	The relationship between parental health literacy levels and anthropometric measurements of children in Turkey	Aygun; Topcu (2023)[43]	2.000	0	60.0020	BMC Pediatrics	Identify the relationship between parents' health literacy levels and children's anthropometric measurements in Turkey.
13	Maternal health literacy of ethnic Hungarian mothers	Sántha (2019)[44]	0.400	4	44.0004	Kontakt	Assess the health literacy of ethnic Hungarian mothers in Romania, focusing on the health of their children aged 10 years or younger.

Legend: *IF – impact factor consulted in Journal Citation Reports 2023; †Ci – number of citations consulted in Google Scholar; ‡journal whose latest impact factor corresponds to the year 2021

Concerning the country of origin, five studies (38.5%) were conducted in the United States of America,[34-37,41] two (15.4%) in Turkey,[38,43] one (7.7%) was conducted across different European countries (Slovakia, Hungary, and Romania),[39] and one study (7.7%) was conducted in each of the following countries: Germany,[32] Australia,[42] India,[33] Iran,[4] and Romania.[44] They were published in English[32-44] in 2015 (n=2; 15.4%),[33,41] 2016 (n=1; 7.7%),[35] 2018 (n=2; 15.4%),[34,36] 2019 (n=1; 7.7%),[44] 2020 (n=2; 15.4%),[32,37] 2021 (n=1; 7.7%),[39] 2023 (n=3; 23.1%),[40,42-43] and 2024 (n=1; 7.7%).[38]

All studies adopted a quantitative methodological approach.[32-44] Concerning participant characteristics, in six articles (46.2%),[33-34,38-39,40,44] all participants were women, predominantly mothers. In the remaining seven articles (53.8%),[32,35-37,41-43] although participants of both sexes were included, women still constituted the majority.

It is worth noting that nine articles (69.2%)[32,34-36,38-40,42-43] used one or two validated instruments to assess HL according to their respective study objectives. The Turkish Health Literacy Scale-32 (THLS-32)[38,43] and the European Health Literacy Survey Questionnaire — modified short version (HLS-EU-Q16)[32,39] were each used in two articles. The following instruments were each used in only one article: Newest Vital Signs (NVS);[34] Short Test of Functional Health Literacy in Adults (STOFHLA);[35] Short Assessment of Health Literacy-English (SAHL-E);[36] Short Assessment of Health Literacy-Spanish (SAHL-S);[36] Iranian Health Literacy Questionnaire (IHLQ);[40] All Aspects of Health Literacy Scale (AAHLS);[42] and Brief Health Literacy Screen (BHLS).[39] The remaining four articles (30.8%)[33,37,41,44] did not use HL assessment instruments.

Discussion

The publication profile follows a linguistic pattern in which English is clearly predominant. This finding is supported by a study conducted using the WoS database, which identified a progressive increase in the proportion of articles published in English and found that articles written in native languages tend to receive fewer citations outside their countries of origin, reinforcing the role of English as the dominant language of global scientific communication.[45]

The frequency of publications increased over the years, with the largest number of articles published in 2021 and 2024, followed by a slight decline in 2022 and 2023. In this context, it is important to emphasize that HL has become increasingly relevant as awareness grows regarding its impact on quality of life and its applicability across different areas of healthcare. As a result, an increasing number of researchers have become interested in the topic and contributed to its development, leading to advances in research and the implementation of innovative strategies.[46]

The analysis of author productivity revealed an uneven distribution, with a small number of researchers accounting for most of the publications. This finding is consistent with Lotka's Law, which states that most authors tend to contribute a limited number of publications, whereas a minority are responsible for producing a substantial number of articles.[22]

As for Bradford's Law, a small number of journals with high impact factors accounted for approximately one-third of the publications. This finding is related to the fact that well-established journals seek to meet quality standards and the criteria required for indexing in databases, electronic libraries, and other repositories. Their objective is to disseminate research, enhance journal recognition, and promote scientific dialogue across different fields of knowledge.[31] Consequently, it is not surprising that these journals are, or become, the preferred outlets for authors submitting manuscripts on this topic.

Application of Zipf's Law revealed that the most frequent keywords were reported in English, with a particularly high frequency of the term "HL". This finding highlights the centrality of the topic within the publications and reflects the authors' concern with assessing and understanding caregivers' use of health information to promote children's health.

International organizations such as the World Health Organization emphasize that, among the 17 SDGs, SDG 3 aims to ensure healthy lives and promote well-being for all people at all ages. This reinforces the importance of HL as a key element in strengthening and improving healthcare services and healthcare delivery at both the individual and population levels. For these and other reasons, HL has become a topic of considerable global relevance and visibility,[47-48] as demonstrated by the studies included in this review.

The high frequency of the terms "female" and "child" also suggests that many of these studies focused on children's health, with women serving as caregivers and representing the majority or primary participants. This emphasizes both the structural vulnerabilities affecting this population and the relevance of health education actions and strategies and their relationship with HL. A study conducted in the United States, for example, demonstrated that low-income mothers with low HL tend to adopt inadequate or unsatisfactory caregiving practices, negatively affecting children's growth and development.[34]

Another highly frequent keyword was "male", indicating some degree of male participation in the studies, most commonly fathers. A study conducted in a regional community in Australia that assessed the HL of parents and caregivers found low male

participation, with fathers accounting for only 11.6% of participants.[42] Likewise, a study conducted in Turkey investigating parental HL and children's anthropometric measurements reported that only ten (2.6%) of the 378 participants were fathers.[43] These findings suggest that women, particularly mothers, remain primarily responsible for child care.

Among the articles selected through *Methodi Ordinatio*, the United States was the country with the largest number of publications, consistent with another literature review of HL studies published between 2009 and 2014, which suggested that the U.S. context has strongly influenced the development of research on this topic.[49]

No studies conducted in Brazil were identified, highlighting the need to invest in research involving caregivers and children across the different regions of the country, with an emphasis on aspects that underscore HL as an essential element for understanding this topic. Therefore, institutional support from private organizations and government agencies, particularly in higher education, represents a *sine qua non* condition for enabling researchers to receive adequate training, work under appropriate conditions, and have sufficient financial, material, and technical/technological resources to conduct robust research that not only describes the living and health conditions characterizing different social realities but also contributes effectively to transforming them.

This is particularly important because a large proportion of the Brazilian population has inadequate or insufficient levels of HL, as well as cognitive, structural, and operational limitations related to HL, especially among individuals living in situations of greater social vulnerability. In this regard, research activities can contribute to the development of more effective public policies and health education strategies.[50]

It is worth noting that most of the articles used validated instruments to assess HL, indicating the increasing adoption of these tools. For instance, a European study assessing HL and its inequalities among mothers employed two instruments: the BHLS and the HLS-EU-Q16. Their selection was justified, in part, by the widespread use of the HLS-EU-Q16 in Europe and by the fact that both instruments can be applied across different population groups, enabling rapid and efficient HL screening.[39]

Parental understanding of health plays a fundamental role in disease prevention, therapeutic processes, and the promotion of children's health, as confirmed by a study conducted in Turkey. That study showed that the HL of parents of children aged 0 to 6 years was associated with their children's anthropometric profile, with adequate HL being positively associated with satisfactory weight and height values.[43]

Other studies indicate that deficiencies in parents' knowledge may directly affect children's well-being by compromising treatment adherence, symptom recognition, and the adoption of healthy practices. Caregivers with low HL tend to make decisions that are less informed by a critical-reflective process regarding the care of their children, which may negatively affect child health.[32,38,40-41]

Evidence indicates that caregivers with a better understanding of health information tend to be better prepared to make safe and effective decisions regarding daily care, including the appropriate management of symptoms, treatment adherence, and the prevention of complications. This leads to better clinical outcomes and enhances the effectiveness of healthcare delivery processes. These aspects directly affect caregivers' daily lives by reducing emotional burden, increasing confidence in performing caregiving tasks, and contributing to a better quality of life.[32,38]

Accordingly, there is a clear need for educational actions and strategies aimed at families to strengthen child care.[41] Therefore, the findings of this study highlight the importance of training programs and public policies for parents and caregivers, ensuring that they have access to understandable and accessible information to effectively promote the health of the children under their care.

The limitations of this study are associated with the databases used because, although they are numerous and cover both national and international scientific literature, they may not include all relevant studies on the topic. In addition, only the white literature was considered. These limitations provide an opportunity for nurses and researchers from different fields to conduct additional bibliometric studies incorporating a larger number of databases and the gray literature, which includes materials that have not undergone anonymous peer review and have not been

published in scientific journals, such as legal or institutional documents and undergraduate and graduate academic works (monographs, master's dissertations, and doctoral theses).

The findings are expected to increase the visibility of research that contributes to understanding how this topic has been addressed in the scientific literature by identifying bibliometric characteristics and methodological approaches. Furthermore, they provide a foundation for future research in nursing and related fields, as well as for discussions on health promotion strategies, contributing to the development and dissemination of knowledge and to greater visibility of children within healthcare settings. Finally, they reinforce the importance of educational strategies targeting caregivers to improve child health outcomes.

These findings highlight the need to strengthen policies and programs directed toward children, which requires the joint and effective participation of healthcare users through social participation, as well as the involvement of the various institutional stakeholders — including healthcare professionals, managers, and public authorities — responsible for planning, implementing, assessing, and monitoring the corresponding actions and strategies.

Conclusion

This study made it possible to quantify the scientific production on caregivers' HL regarding the promotion of children's health, identifying that most articles were published in 2021 and 2024 and were written in English. In this context, the study demonstrated author productivity and collaboration networks, journal productivity, the frequency and distribution of keywords, and the characteristics of the most relevant articles according to their bibliometric indicators. It was found that, despite the large volume of studies on the topic, only a small proportion are considered highly relevant from a bibliometric perspective.

These findings indicate the need for the academic community to invest in research capable of producing articles of sufficient quality to be published in nationally and internationally indexed journals, thereby facilitating their broad dissemination and increasing their citation impact.

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Authorship contribution

1 – Lúvia Santos da Silva
Nurse, Master – luviasantos91@gmail
Research conception and/or development and/or manuscript writing; Review and approval of the final version

2 – Eliza Paixão da Silva
Corresponding author
Nurse, Master – enfa.elizapaixao@gmail.com
Research conception and/or development and/or manuscript writing; Review and approval of the final version

3 – Erlon Gabriel Rego de Andrade
Nurse, Master – erlon.rego@gmail.com
Research conception and/or development and/or manuscript writing; Review and approval of the final version

4 – Ivaneide Leal Ataíde Rodrigues
Nurse, Doctor – ivaleal2016@gmail.com
Research conception and/or development and/or manuscript writing; Review and approval of the final version

5 – Alexandre Aguiar Pereira
Nurse, Master – alexandre_ap22@hotmail.com
Research conception and/or development and/or manuscript writing; Review and approval of the final version

6 – Laura Maria Vidal Nogueira
Nurse, Doctor – lauramavidal@gmail.com
Review and approval of the final version

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