Research article

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Mapping Global Research on Critical Health Literacy : A Bibliometric Analysis of Publications Indexed in Dimensions

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Abstract: Critical Health Literacy (CHL) is an advanced dimension of health literacy that enables individuals to critically evaluate health information and make informed health decisions. Despite growing scholarly attention, a comprehensive overview of global CHL research remains limited. This study aimed to analyze publication trends, influential contributors, collaboration networks, and thematic developments in CHL research through bibliometric analysis. A total of 179 open-access publications indexed in the Dimensions database between 2021 and 2025 were retrieved using the keyword "Critical Health Literacy" and screened according to the PRISMA 2020 guidelines. Bibliometric analyses were conducted using Biblioshiny and VOSviewer. The results indicated a steady increase in CHL publications, with 2025 recording the highest output (n = 58, 32.40%). Japan was the most productive country (n = 34), while Australia achieved the highest citation impact (398 citations). Norway demonstrated the strongest international collaboration network (Total Link Strength = 22). OsloMet – Oslo Metropolitan University emerged as the leading institution, contributing 9 publications and receiving 82 citations. Keyword co-occurrence analysis identified ten thematic clusters, highlighting major research areas including health decision-making, evidence-based practice, digital health literacy, measurement instruments, and patient empowerment. These findings provide insights into the intellectual structure and evolving research landscape of CHL and emphasize the importance of international collaboration in advancing health literacy research and evidence-based health promotion worldwide.

Keywords: Critical health literacy, Bibliometric analysis, Digital health literacy, Health decision-making, VOSviewer, Dimensions

INTRODUCTION

The rapid expansion of digital technology has fundamentally transformed the ways in which individuals access, evaluate, and use health information. The proliferation of online health platforms, social media, and mobile health applications has made an unprecedented volume of health-related content available to the general public [1].

However, the availability of large quantities of health information does not necessarily translate into informed health decision-making. Misinformation, low-quality content, and the complexity of biomedical knowledge continue to pose significant challenges for lay individuals navigating digital health environments [2]. In this context, health literacy has emerged as a critical determinant of health outcomes, equipping individuals with the

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competencies needed to access, comprehend, appraise, and apply health information effectively [3,4].

Health literacy is widely recognized as a multidimensional construct. Nutbeam proposed a foundational taxonomy comprising three progressive levels: functional health literacy, which encompasses basic reading and writing skills sufficient to function in healthcare settings; communicative or interactive health literacy, which involves the ability to extract and apply new information through social interaction; and critical health literacy (CHL), representing the most advanced level, characterized by the ability to critically analyze health information, appraise its credibility, and apply such knowledge to exert greater control over life events and situational determinants of health [3]. This hierarchical framework has been widely adopted in subsequent health promotion research and policy development [5,6].

Critical Health Literacy has garnered increasing scholarly attention in recent decades, particularly in response to the dual challenges of information overload and health disparities. Abel and Benkert conceptualize CHL as encompassing reflective thinking about the social determinants of health and the capacity to act—individually and collectively—to address health inequities [7]. This formulation extends CHL beyond individual competence to encompass civic engagement and structural change. Sykes et al. further emphasize that CHL integrates cognitive, social, and political dimensions, enabling individuals not merely to understand health messages but to critically interrogate the conditions that produce and perpetuate health inequalities [8]. These perspectives underscore the public health significance of CHL as a lever for promoting equity and empowering marginalized populations [9].

The intersection of CHL with digital health has given rise to the related construct of digital health literacy, defined as the ability to seek, find, understand, and appraise health information from electronic sources and apply the knowledge gained to addressing or solving a health problem [10]. Yang et al. documented a continuous growth in publications on digital health literacy since 2015, with a marked acceleration during the COVID-19 pandemic, reflecting urgent societal demand for skills in evaluating online health information [11]. The pandemic context demonstrated that the inability to critically appraise information sources—particularly regarding vaccine safety, treatment options, and public health guidelines—carried measurable consequences for individual and population health outcomes [2,12].

Bibliometric analysis has been established as a rigorous and systematic method for mapping the intellectual structure, publication trends, and collaborative networks within a scholarly domain [13]. By applying quantitative indicators derived from bibliographic databases, bibliometric studies enable researchers to identify prolific authors, influential journals, thematic clusters, and international collaboration patterns, thereby providing a comprehensive overview of a field's development trajectory [14,15]. Several bibliometric studies have examined health literacy broadly and digital health literacy specifically; however, a systematic bibliometric investigation focused exclusively on Critical Health Literacy, covering the period 2021–2025, remains notably absent from the literature.

Addressing this gap, the present study conducts a bibliometric analysis of peer-reviewed publications on Critical Health Literacy indexed in the Dimensions database from 2021 to 2025. The study employs Biblioshiny (built on the Bibliometrix R package) and VOSviewer to analyze publication trends, identify key contributors, and map the intellectual and collaborative structure of the CHL research domain. The findings are intended to serve researchers, educators, and policymakers seeking to understand the current state of CHL knowledge and to identify priorities for future research and health promotion practice.

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Research Objectives

This study was guided by the following objectives:

1. To examine the publication output, growth trends, and bibliometric characteristics of Critical Health Literacy (CHL) research indexed in the Dimensions database from 2021 to 2025.
2. To identify the most productive authors, influential institutions, leading countries, and core journals contributing to the development of CHL research.
3. To analyze patterns of international scientific collaboration among authors, institutions, and countries in the field of CHL.
4. To map the intellectual structure, thematic evolution, and emerging research trends in CHL through keyword co-occurrence and network analysis.
5. To identify highly cited publications and evaluate their influence on the advancement of CHL research worldwide.

MATERIALS AND METHODS

Study Design

This study employed a bibliometric analysis design to systematically examine the volume, structure, and intellectual development of research on Critical Health Literacy (CHL). Bibliometric analysis is a well-established quantitative method for evaluating scholarly literature through mathematical and statistical approaches applied to bibliographic data [13,16]. The method enables researchers to identify publication trends, key contributors, collaborative networks, and thematic clusters within a defined body of literature, thereby providing a rigorous evidence base for understanding a field's development trajectory [14,15]. This approach has been widely adopted in health-related bibliometric studies [11,17] and was deemed appropriate for mapping the current state of CHL scholarship.

Data Source and Search Strategy

Data were retrieved from the Dimensions database (https://app.dimensions.ai), a multidisciplinary academic database that indexes publications across a wide range of scientific disciplines and offers comprehensive coverage of peer-reviewed literature, citation data, and metadata [18]. Dimensions was selected over alternative databases (e.g., Web of Science, Scopus) due to its broader scope, open-access orientation, and suitability for bibliometric research in health and social sciences [19].

The search was conducted in May 2025 using the keyword "Critical Health Literacy" applied to title, abstract, and keyword fields. The search was supplemented by the terms "digital health", "*eHealth*", and "*health literacy*" to capture relevant conceptual overlaps within the CHL domain. The publication timeframe was restricted to 2021–2025 to reflect the most recent and rapidly evolving scholarly landscape in CHL research. Retrieved records were exported in CSV format containing full bibliographic metadata, including title, authors, year of publication, source title, citation count, and author keywords.

Eligibility Criteria and Document Selection (PRISMA 2020)

Document screening and selection followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines [20] to ensure methodological transparency and reproducibility. The process was conducted across four sequential phases, as summarized below.

Inclusion criteria were: (1) peer-reviewed original research articles; (2) published between January 2021 and December 2025; (3) indexed in the Dimensions database; (4) available as open-access publications; and (5) containing sufficient bibliographic metadata (title, authors, year, source, keywords) for analysis. Exclusion criteria comprised: (1) book chapters, editorials, conference abstracts, and grey literature; (2) non-open-access documents for which full metadata were unavailable; and (3) publications with incomplete or corrupted bibliographic records.

Analytical Approach

Bibliometric analysis was conducted using two complementary software platforms, each serving distinct analytical functions:

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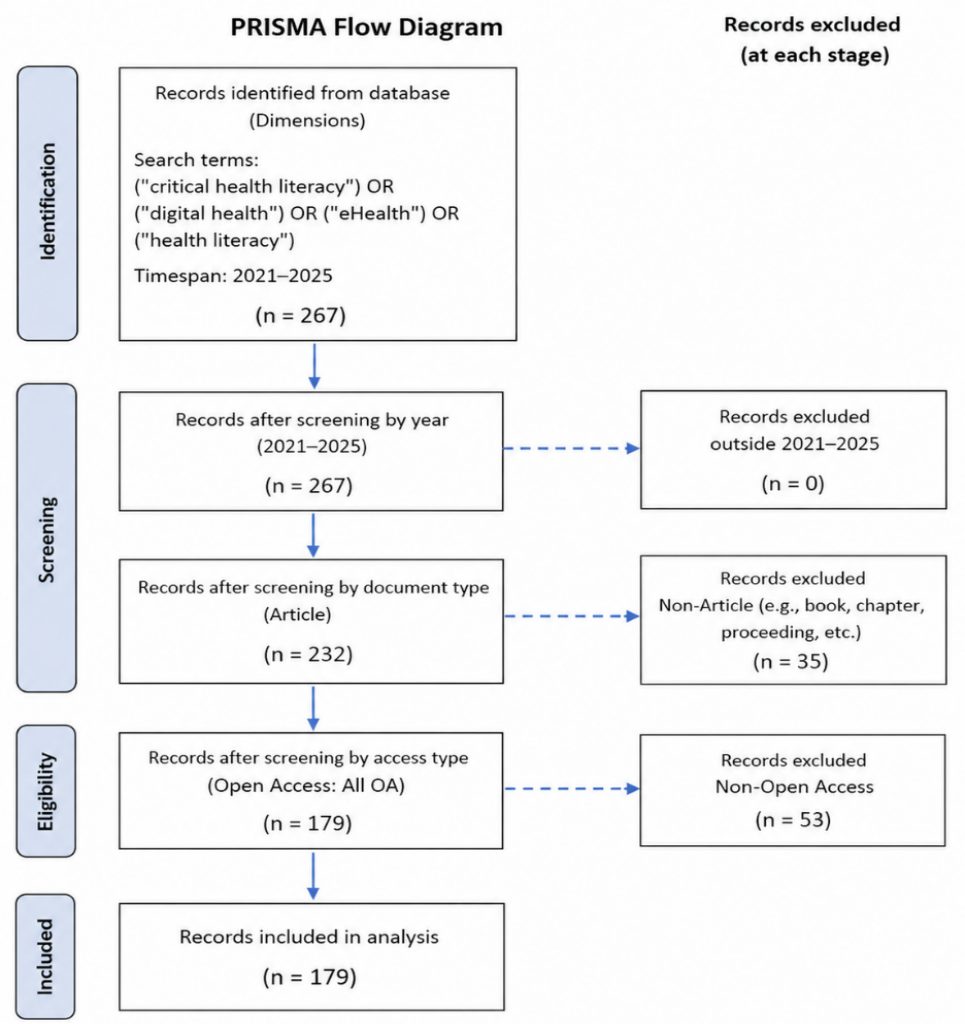


Figure 1. PRISMA flow diagram showing the identification, screening, eligibility assessment, and inclusion process of publications related to critical health literacy retrieved from the Dimensions database during 2021–2025.

Biblioshiny (Bibliometrix R package)

Used for quantitative bibliometric indicators: annual publication trends, author productivity, institutional and country-level output, source analysis, and highly cited article identification. Provides the web-based interface of the bibliometrix R package [14].

VOSviewer (v.1.6.20)

Used for network visualization: keyword co-occurrence mapping, author collaboration networks, and country-level co-authorship analysis. Visualizes bibliometric networks using similarity-based clustering [15,21].

The specific analyses performed in this study were organized across four domains:

(1) Annual Publication Trends

The volume of publications per year was computed to identify growth trajectories in CHL research output between 2021 and 2025. Annual growth rates were calculated to quantify changes in scholarly productivity over time [17].

(2) Author, Institution, and Country Analysis

Prolific authors were identified based on total document count, total citations received, and Total Link Strength (TLS) derived from co-authorship

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network analysis. Institutional analysis followed the same indicators to identify leading research organizations. Country-level analysis examined geographic distribution of publication output, citation impact, and international collaboration strength. TLS was adopted as the primary indicator of collaboration network connectivity, as it reflects the cumulative weight of all co-authorship or co-occurrence links associated with a given entity [21].

(3) Keyword Co-occurrence Analysis

Author keywords were extracted from the dataset and subjected to co-occurrence analysis using VOSviewer. A minimum occurrence threshold of five was applied to identify statistically meaningful keyword associations. Co-occurrence networks were generated to reveal thematic clusters, identify dominant research topics, and map conceptual linkages within the CHL literature [15]. Cluster membership was determined by VOSviewer's modularity-based clustering algorithm, with each cluster representing a coherent research theme.

(4) Highly Cited Article Analysis

Articles were ranked by total citation count to identify the most influential publications within the study period. Citations per year (CPY) were also calculated to adjust for publication age and identify articles with sustained and growing scholarly impact [13]. Thematic content of the top-cited articles was reviewed to characterize the substantive research priorities that have attracted greatest academic attention in the field.

(5) Three-Field Plot Analysis

A Three-Field Plot analysis was conducted using the Bibliometrix package in R to examine the relationships among authors' keywords, authors, and publication sources. This visualization technique integrates three bibliometric dimensions into a single network, enabling the identification of knowledge structures and publication patterns within the field [14]. The width of the connecting links represents the strength of associations among keywords, authors, and journals. The analysis was used to identify dominant research themes, influential scholars, and major publication outlets contributing to the development of critical health literacy research.

Ethical Considerations

This study analyzed publicly available bibliographic data retrieved from an open-access academic database. No human participants were involved, and no personal or sensitive data were collected. Accordingly, formal ethical approval was not required. All data sources and analytical procedures are reported transparently in accordance with established bibliometric reporting standards [13,20].

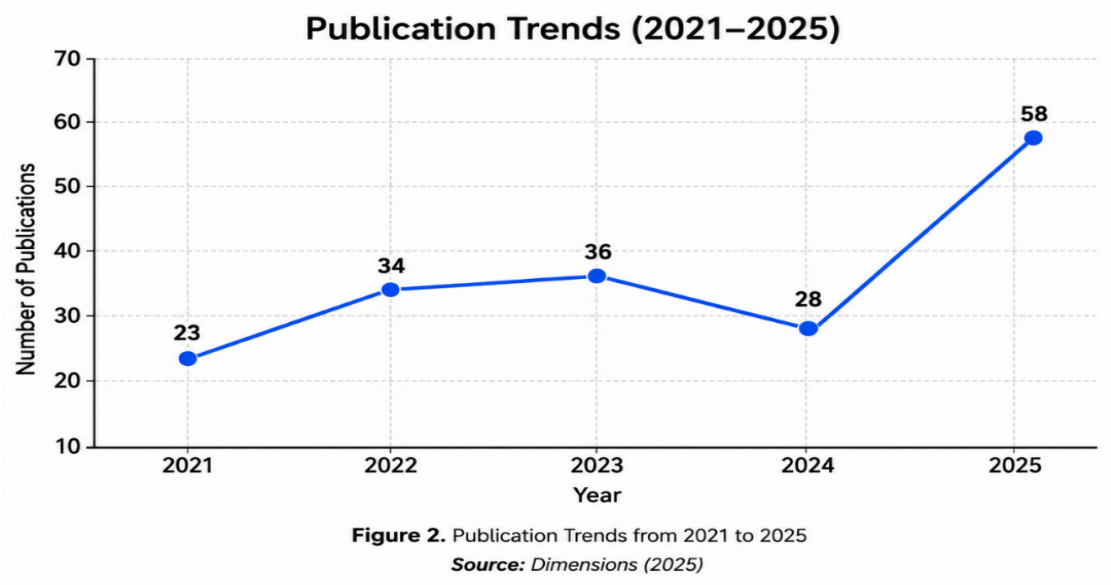


Figure 2. Annual publication trends of Critical Health Literacy research indexed in Dimensions (2021–2025).

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RESULTS

Publication Trends (2021–2025)

A total of 179 open-access peer-reviewed articles on Critical Health Literacy were included in the final analysis. Overall, publication output demonstrated a continuous upward trajectory across the study period, with a notable peak in 2025. Specifically, 23 articles were published in 2021 (12.85%), increasing to 34 in 2022 (18.99%) and 36 in 2023 (20.11%). A slight decline was observed in 2024 (n = 28; 15.64%), before a marked surge to 58 articles in 2025 (32.40%), representing the highest annual output within the study period. The annual growth rate between 2021 and 2025 was approximately 26.1%, indicating accelerating global interest in CHL research, particularly in the context of expanding digital health environments. Annual publication trends are illustrated in Figure 2.

Prolific Authors and Co-authorship Networks

Table 1 presents the ten most prolific authors in CHL research during the study period. Eight authors — Chesire, Faith; Kaseje, Margaret; Lewin, Simon; Mugisha, Michael; Nsangi, Allen; Oxman, Andrew D.; Oxman, Matt; and Sewankambo, Nelson K. — each contributed five publications, with identical citation counts (33) and Total Link Strength (TLS = 56), reflecting strong collaborative ties within a shared research network. Dahlgren, Astrid, also with five publications, received the highest number of citations among the top authors (n = 42), suggesting broader scholarly influence. Moberg, Jenny ranked tenth with four publications and 11 citations.

Co-authorship network analysis revealed several distinct collaborative clusters, as illustrated in Figure 3. Authors within the same cluster demonstrated high levels of joint publication activity, while certain authors served as bridge nodes connecting multiple clusters, facilitating inter-network knowledge exchange. Node size reflects the number of publications or collaborative connections, and link thickness indicates co-authorship frequency.

Institutional Contributions

Table 2 presents the ten most productive institutions in CHL research. OsloMet – Oslo Metropolitan University ranked first in both document count (n = 9) and total citations (n = 82), indicating strong scholarly output and academic influence. Norwegian Institute of Public Health followed with seven documents and 67 citations, and achieved the highest TLS value (35) among all institutions, reflecting the most extensive collaboration network. Six institutions — Makerere

Table 1. Top 10 most prolific authors in Critical Health Literacy research (2021–2025)

Rank	Author	Documents	Citations	Total Link Strength
1	Chesire, Faith	5	33	56
1	Kaseje, Margaret	5	33	56
1	Lewin, Simon	5	33	56
1	Mugisha, Michael	5	33	56
1	Nsangi, Allen	5	33	56
1	Oxman, Andrew D.	5	33	56
1	Oxman, Matt	5	33	56
1	Sewankambo, Nelson K.	5	33	56
9	Dahlgren, Astrid	5	42	36
10	Moberg, Jenny	4	11	46

Note. TLS = Total Link Strength derived from co-authorship network analysis in VOSviewer.

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University, Norwegian University of Science and Technology, South African Medical Research Council, Tropical Institute of Community Health and Development, University of Oslo, and University of Rwanda — each produced five documents with identical citations (33) and TLS (34), suggesting coordinated research activity within a shared multinational consortium. Fukushima Medical University and Yokohama City University represented emerging contributors from Japan with comparatively lower output and network connectivity.

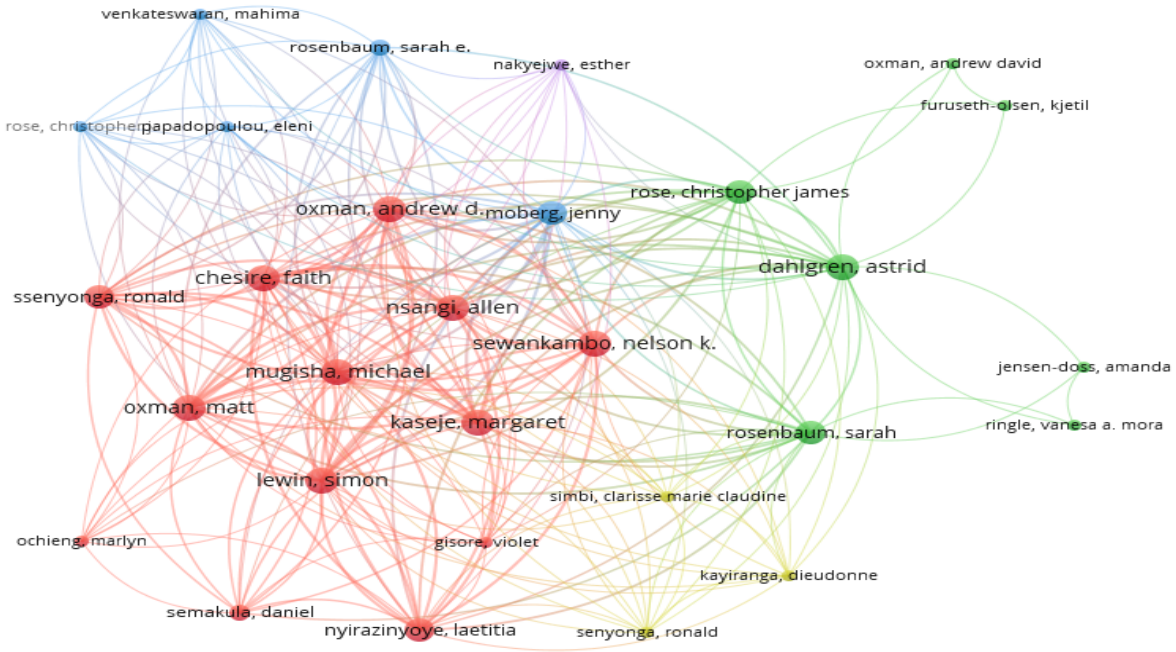


Figure 3. Co-authorship collaboration network among prolific authors in Critical Health Literacy research (VOSviewer).

Table 2. Top 10 institutions contributing to Critical Health Literacy research (2021–2025)

Institution	Documents	Citations	Total Link Strength
OsloMet – Oslo Metropolitan University	9	82	29
Norwegian Institute of Public Health	7	67	35
Makerere University	5	33	34
Norwegian University of Science and Technology	5	33	34
South African Medical Research Council	5	33	34
Tropical Institute of Community Health and Development	5	33	34
University of Oslo	5	33	34
University of Rwanda	5	33	34
Fukushima Medical University	4	18	15
Yokohama City University	3	0	12

Note. TLS = Total Link Strength. Institutions are ranked by document count, then by citations.

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Table 3. Geographic distribution of Critical Health Literacy publications — top 10 countries (2021–2025)

Country	Documents	Citations	Total Link Strength
Japan	34	217	6
Australia	18	398	8
China	15	190	5
United Kingdom	13	97	9
Sweden	13	147	1
Norway	12	117	22
United States	10	95	8
Switzerland	8	119	5
Germany	7	21	5
Taiwan	6	54	1

Note. TLS = Total Link Strength reflecting strength of international co-authorship connections.

Country-Level Analysis and International Collaboration

Table 3 presents the geographic distribution of CHL publications. Japan led in total publication volume (n = 34), followed by Australia (n = 18) and China (n = 15). Despite ranking second in output, Australia recorded the highest citation count (398), substantially exceeding all other countries, which suggests that Australian contributions carry disproportionate scholarly influence relative to their volume. Japan ranked second in citations (217), followed by China (190). In terms of international collaboration strength, Norway recorded the highest TLS (22), followed by the United Kingdom (9), and Australia and the United States (both TLS = 8). Countries in Asia, Europe, and Oceania collectively dominated both output and collaborative activity in this field.

Source Journals

Table 4 presents the ten most productive journals for CHL research. BMC Public Health was the leading publication venue with 11 articles and the highest total citations (242; mean = 22.00 per article). The European Journal of Public Health ranked second by volume (n = 10), though with

Table 4. Leading journals publishing Critical Health Literacy research (2021–2025)

Journal	Articles	Total Citations	Mean Citations/Article
BMC Public Health	11	242	22.00
European Journal of Public Health	10	6	0.60
Frontiers in Public Health	9	127	14.11
International Journal of Environmental Research and Public Health	7	101	14.43
Journal of Medical Internet Research	5	178	35.60
Health Promotion International	5	85	17.00
PLOS ONE	5	81	16.20
Healthcare	5	20	4.00
Trials	4	11	2.75
BMJ Open	3	28	9.33

Note. Mean citations per article calculated as total citations divided by number of articles per journal.

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relatively low citation impact (mean = 0.60). Frontiers in Public Health contributed 9 articles (mean citations = 14.11). Notably, the Journal of Medical Internet Research (JMIR) published only 5 articles but achieved the highest citation impact per article (mean = 35.60), reflecting the elevated influence of technology-oriented health research within digital health discourse. Health Promotion International and PLOS ONE each contributed 5 articles with citation means of 17.00 and 16.20, respectively.

Keyword Co-occurrence Analysis

Keyword co-occurrence analysis identified 265 significant terms organized into 10 thematic clusters, with 6,055 co-occurrence links and a Total Link Strength of 37,216, indicating a densely interconnected knowledge structure. The ten most frequent and relevant keywords are presented in Table 5. The term patient appeared most frequently (250 occurrences), followed by person (107) and decision making (28), reflecting a predominant

Table 5. Top 10 keywords by occurrence frequency and relevance score in CHL literature

Rank	Keyword	Occurrences	Relevance Score
1	Term	20	0.56
2	Person	107	0.56
3	May	12	0.56
4	Decision making	28	0.54
5	Critical health literacy scale	34	0.54
6	Patient	250	0.52
7	Tool	34	0.52
8	Evidence	33	0.51
9	China	23	0.51
10	Benefit	19	0.51

Note. Relevance scores computed by VOSviewer based on average co-occurrence weighted links.

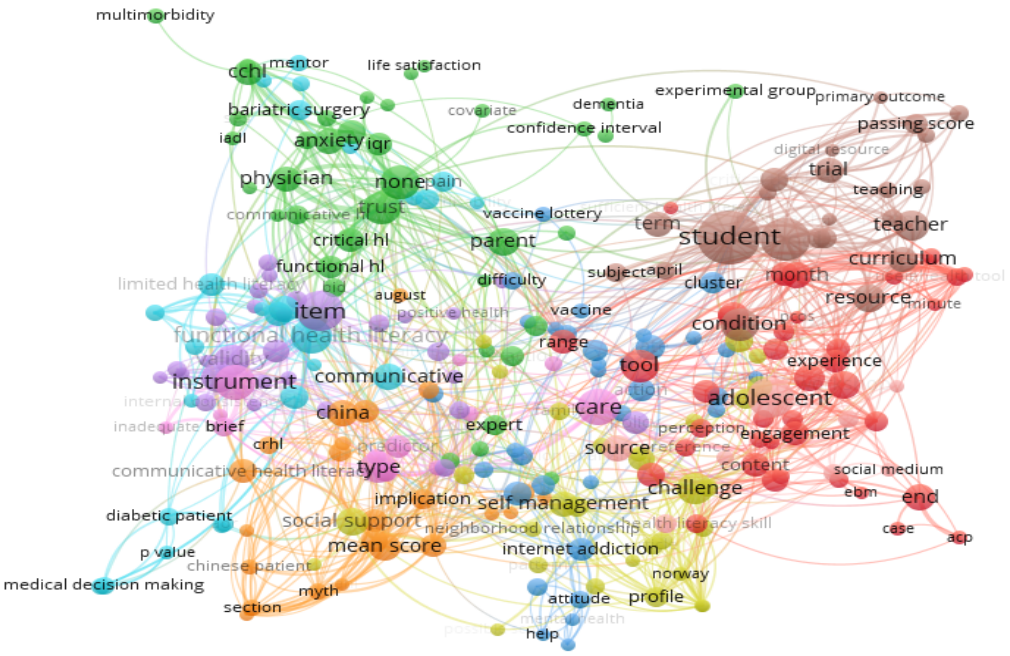


Figure 4. Keyword co-occurrence network of Critical Health Literacy research (VOSviewer; 265 items, 10 clusters, 6,055 links; minimum occurrence threshold = 5).

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focus on patient-centered health literacy and healthcare decision support. The critical health literacy scale (34 occurrences; relevance = 0.54) and tool (34 occurrences; relevance = 0.52) indicated strong emphasis on instrument development and measurement. The keyword evidence (33 occurrences) underscored the field's commitment to evidence-based practice, while china (23 occurrences) reflected significant research activity from that country. The keyword co-occurrence network is visualized in Figure 4.

Highly Cited Articles

Table 6 presents the ten most frequently cited articles within the dataset. Citation counts ranged from 42 to 125. The most cited article was Taba et al. (2022), published in BMC Public Health, which examined adolescents' self-efficacy and digital health literacy using a cross-sectional mixed-methods design (125 citations). This was followed by Dinh and Bonner (2023), who investigated relationships between health literacy, social support, self-efficacy, and self-management in adults with multiple chronic conditions (113 citations). Rasheed et al. (2021) contributed the third most cited work, focusing on socioeconomic and environmental impacts of COVID-19 in Pakistan (109 citations). Additional high-impact articles addressed online health information seeking in chronic disease patients (Zhao et al., 2022; 92 citations), lifestyle counseling in polycystic ovary syndrome (Ee et al., 2021; 70 citations), and digital health literacy interventions in adolescents (Mancone et al., 2024; 69 citations). Abel and Benkert's (2022) conceptual paper on CHL as reflection and action for health received 60 citations, affirming its foundational theoretical influence. The thematic content of these highly cited works collectively reflects a convergence around digital health literacy, patient self-management, evidence-based decision-making, and health equity — representing the most influential research directions in the contemporary CHL literature.

Table 6. Top 10 most cited articles in Critical Health Literacy research (2021–2025)

Rank	Title	Author(s)	Year	Journal	Citations
1	Adolescents' self-efficacy and digital health literacy: a cross-sectional mixed methods study	Taba et al.	2022	*BMC Public Health*	125
2	Exploring the relationships between health literacy, social support, self-efficacy and self-management in adults with multiple chronic diseases	Dinh & Bonner	2023	*BMC Health Services Research*	113
3	Socio-economic and environmental impacts of COVID-19 pandemic in Pakistan — an integrated analysis	Rasheed et al.	2021	*Environmental Science and Pollution Research*	109
4	Online health information seeking among patients with chronic conditions	Zhao et al.	2022	*Journal of Medical Internet Research*	92
5	Providing lifestyle advice to women with PCOS	Ee et al.	2021	*BMC Endocrine Disorders*	70
6	Integrating digital and interactive approaches in adolescent health literacy	Mancone et al.	2024	*Frontiers in Public Health*	69
7	Critical health literacy: reflection and action for health	Abel & Benkert	2022	*Health Promotion International*	60
8	Health literacy levels among women in the prenatal period: a systematic review	Meldgaard et al.	2022	*Sexual & Reproductive Healthcare*	56
9	Health literacy and digital health information-seeking behavior	Sundell et al.	2022	*BMC Public Health*	50
10	Experiences and factors affecting usage of an eHealth tool for self-management	Marklund et al.	2021	*Journal of Medical Internet Research*	42

Note. Citation counts retrieved from Dimensions database as of May 2025.

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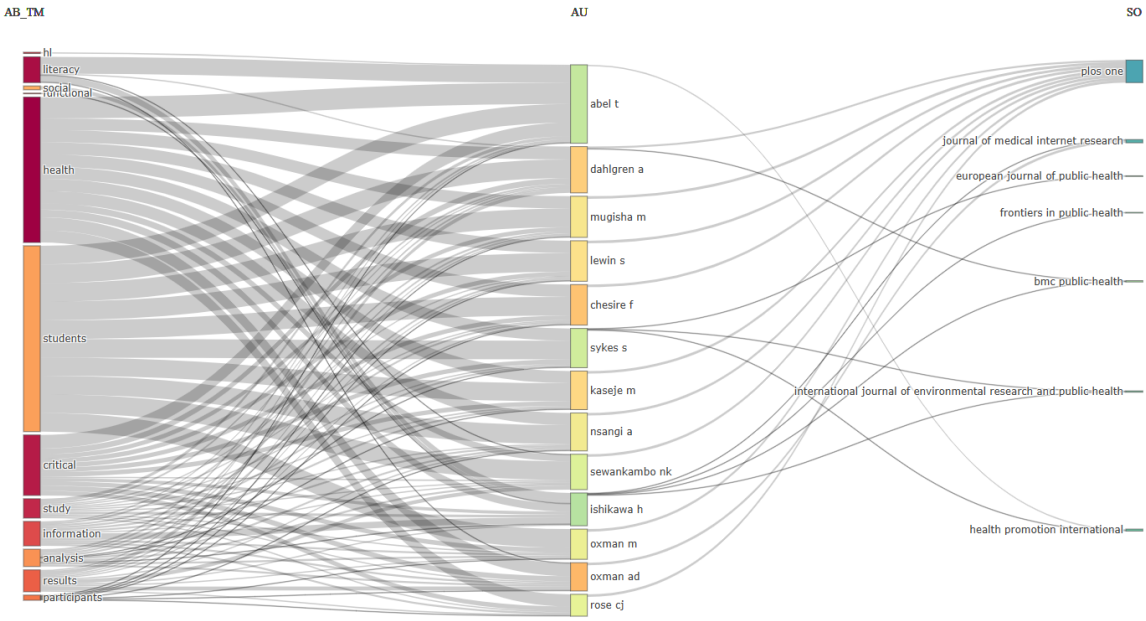


Figure 5. Three-Field Plot Showing the Relationships among Authors' Keywords, Authors, and Publication Sources in Critical Health Literacy Research (2021–2025)

Analysis of Relationships among Keywords, Authors, and Publication Sources

Figure 5 presents the Three-Field Plot analysis showing the relationships among authors' keywords, authors, and publication sources. The most prominent keywords were literacy, health, students, and critical, with literacy and health exhibiting the strongest connections. The most influential authors included Abel T., Dahlgren A., Mugisha M., and Lewin S., while the leading publication sources were PLOS ONE, Journal of Medical Internet Research, European Journal of Public Health, and BMC Public Health. These findings indicate that critical health literacy research is strongly centered on health literacy concepts and is disseminated through major public health and health promotion journals.

DISCUSSION

Growing Global Interest in Critical Health Literacy

The findings of this study confirm a sustained and accelerating growth in scholarly publications on Critical Health Literacy between 2021 and 2025, with an annual growth rate of approximately 26.1% and a peak output of 58 articles in 2025. This trajectory is consistent with broader trends documented in bibliometric studies of health literacy and digital health, where publication volumes have expanded rapidly in response to evolving societal demands for informed health decision-making [11,17]. The notable surge in 2025 may partly reflect the delayed publication cycle of research conducted during and immediately following the COVID-19 pandemic, a period that exposed critical gaps in public health literacy and underscored the consequences of widespread health misinformation [2,22]. These conditions catalyzed international recognition of CHL as a public health priority, consistent with WHO's (2024) assertion that health literacy is foundational to noncommunicable disease prevention and health system resilience [12].

The finding that 2024 exhibited a slight dip before the 2025 peak may reflect a natural publication lag rather than diminished interest, a pattern observed in other rapidly expanding bibliometric domains [13]. Taken together, the upward trend supports the proposition that CHL has transitioned from a relatively niche academic construct to a mainstream health promotion priority with increasing policy relevance globally [5,4].

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Geographic Concentration and Knowledge Asymmetry

The geographic distribution of CHL research reveals a significant concentration of scholarly output in high-income countries, particularly Japan, Australia, the United Kingdom, Norway, and Sweden. Japan's dominance in publication volume (n = 34) may reflect longstanding national investment in health literacy as part of its health promotion strategy, particularly in the context of an aging population and chronic disease burden [23,24]. Australia's disproportionately high citation impact (398 citations from 18 documents) suggests that Australian researchers are producing high-quality, internationally influential work, consistent with the country's strong track record in health promotion and public health research [25].

Norway's leading Total Link Strength (TLS = 22) reflects the strength and breadth of its international collaborative networks, facilitated in part by its consortium of leading institutions including OsloMet, Norwegian Institute of Public Health, and Norwegian University of Science and Technology. This finding is consistent with evidence that Nordic countries maintain exceptionally robust academic co-authorship networks in health sciences, underpinned by coordinated national research funding and open science policies [26].

However, the relative absence of low- and middle-income countries (LMICs) from the top contributing nations raises important equity concerns. CHL is arguably most critical in resource-constrained settings where health information quality is variable and populations face compounded vulnerabilities [27,28]. The underrepresentation of African, South Asian, and Latin American scholarship in this corpus — with the notable exception of Uganda and Rwanda through the Makerere University consortium — points to structural barriers including limited research funding, journal access inequities, and language biases in global indexing systems [29]. Future research agendas and funding bodies should actively prioritize CHL scholarship in LMICs to ensure that the evidence base reflects the populations most in need of health literacy interventions.

Collaborative Networks and Institutional Leadership

The co-authorship network analysis revealed the dominance of a tightly interconnected multinational cluster anchored by OsloMet, Norwegian Institute of Public Health, Makerere University, South African Medical Research Council, University of Oslo, University of Rwanda, and related institutions. The uniform citation and TLS values across six of these institutions strongly suggest they operate within a coordinated research consortium, likely supported by shared grant funding and co-registered trials. This pattern of structured international collaboration is increasingly recognized as a hallmark of high-impact global health research, enabling the pooling of methodological expertise, participant populations, and analytical resources across settings [30,31].

OsloMet's position as the institution with the highest document count and citations (9 documents; 82 citations) underscores its role as a knowledge hub in CHL scholarship. This is consistent with the institution's established strengths in health sciences education and its commitment to applied public health research aligned with WHO health literacy frameworks [1]. Dahlgren, Astrid, the most cited individual author (42 citations), similarly exemplifies how sustained, theoretically grounded scholarship within a well-networked research environment can achieve disproportionate academic influence.

Thematic Landscape: From Measurement to Digital Empowerment

The keyword co-occurrence analysis, encompassing 265 terms across 10 thematic clusters, reveals a multi-dimensional and evolving research landscape within CHL. The predominance of terms such as patient, decision making, critical health literacy scale, tool, and evidence reflects a field oriented toward operationalizing CHL for clinical and public health practice. This emphasis on measurement and instrumentation aligns with Nutbeam's (2008) observation that the field's maturation depends on the development of

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validated, context-sensitive tools capable of capturing the multidimensional nature of health literacy across diverse populations [32].

The strong presence of decision making as a high-relevance keyword (0.54) corroborates Abel and Benkert's (2022) conceptualization of CHL as inherently action-oriented not merely the capacity to understand health information, but to apply that understanding critically and reflexively to health choices [7]. This perspective extends earlier functional literacy frameworks [3,9] by incorporating social and structural determinants of health into the literacy construct. The keyword cluster analysis further suggests thematic convergence between CHL and self-management, particularly among patients with chronic conditions, consistent with findings from the highly cited articles in this dataset [33,34].

The identification of adolescent and student as prominent nodes within the keyword network reflects growing recognition that CHL competencies must be cultivated early in life to achieve lasting health outcomes [35,36]. Educational interventions targeting adolescents' ability to critically evaluate health information — particularly in digital environments — are therefore a strategically important direction for both research and policy. Mancone et al.'s (2024) integration of digital and interactive approaches in adolescent health literacy, the sixth most cited article in this corpus, illustrates the practical application of this agenda.

The Digital Turn in Critical Health Literacy Research

A defining characteristic of the CHL literature in this study period is its deepening engagement with digital health contexts. The high citation impact of studies addressing digital health literacy [37,38], online health information seeking [39], and eHealth tool usage [40] collectively signals a paradigm shift in how CHL is conceptualized and studied. This digital turn reflects the reality that health information is now predominantly mediated through online platforms, social media, and mobile technologies, demanding critical appraisal skills that extend well beyond traditional literacy competencies [41,42].

The journal profile of the field reinforces this observation. The Journal of Medical Internet Research achieved the highest mean citation rate per article (35.60), underscoring the particular influence of digital health scholarship within the broader CHL literature. This aligns with WHO's Global Strategy on Digital Health 2020–2025 [1], which identifies digital health literacy as a cross-cutting competency necessary for the effective implementation of digital health systems at population scale. The convergence of CHL and digital health literacy suggests that future research frameworks will increasingly need to integrate both constructs, recognizing that the ability to critically evaluate digital health information is itself a fundamental dimension of contemporary health literacy [43,44].

Journal Landscape and Publication Channels

The concentration of CHL research in public health and health promotion journals particularly BMC Public Health, Frontiers in Public Health, and Health Promotion International reflects the field's disciplinary home in health promotion and its applied public health orientation. The strong performance of open-access journals in this corpus is notable and consistent with broader trends toward open science in health research [45]. The dominance of open-access venues in the dataset also has methodological implications, as the study's eligibility criterion of open-access availability may have excluded some highly cited articles published in subscription-based journals, potentially underestimating the influence of certain research traditions. Future bibliometric investigations should consider incorporating multi-database searches and relaxing open-access restrictions to capture a more comprehensive picture of the field.

Discussion of the Relationships among Keywords, Authors, and Publication Sources

The Three-Field Plot analysis revealed that health and literacy were the most dominant and interconnected keywords, indicating that critical health literacy remains the central focus of the research field. The strong linkages among influential authors, including Abel T., Dahlgren A.,

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Mugisha M., and Lewin S., suggest the presence of established scholarly networks that have significantly contributed to knowledge development in this area. Moreover, the concentration of publications in leading journals such as PLOS ONE, Journal of Medical Internet Research, European Journal of Public Health, and BMC Public Health demonstrates the interdisciplinary and international nature of critical health literacy research. These findings are consistent with the framework proposed by Nutbeam (2000), which emphasizes critical health literacy as a key factor in empowering individuals to critically evaluate health information and make informed health decisions [3]. The results further indicate that the field continues to expand through collaborations across public health, health promotion, and digital health disciplines, reflecting the growing global importance of health literacy in improving population health outcomes.

Limitations

Several limitations should be acknowledged when interpreting the findings of this study. First, the analysis was restricted to publications indexed in the Dimensions database, and while Dimensions offers broad multidisciplinary coverage, some relevant CHL publications indexed exclusively in Web of Science, Scopus, or PubMed may have been excluded [19,18]. Second, the eligibility criterion requiring open-access availability may have introduced selection bias toward journals with particular publication models. Third, as with all bibliometric studies, citation counts reflect academic visibility rather than methodological quality, and highly cited articles may achieve prominence for reasons other than scientific rigor including topical salience or novelty during a specific period [13]. Fourth, the study period of 2021–2025 provides a contemporaneous but temporally limited view; a longer timeframe would enable more robust trend analysis and historical contextualization of the field's development. Finally, the analysis did not incorporate full-text content analysis, meaning that nuanced theoretical or methodological shifts within the literature may not be fully captured by keyword and citation data alone.

CONCLUSION

This bibliometric study mapped the global landscape of Critical Health Literacy research indexed in the Dimensions database from 2021 to 2025, analyzing 179 open-access peer-reviewed articles across multiple dimensions including publication trends, authorship, institutional and country-level contributions, journal profiles, keyword co-occurrence networks, and citation impact. The findings collectively advance understanding of how CHL scholarship has developed, where it is concentrated, and where significant gaps remain.

The study documented a sustained upward trajectory in CHL publications, with an annual growth rate of approximately 26.1% and a peak of 58 articles in 2025, confirming that CHL has emerged as a priority research domain within global health promotion discourse. This growth is closely associated with the accelerating integration of digital technologies into health information environments and the heightened public health awareness generated by the COVID-19 pandemic, both of which have amplified the urgency of equipping individuals with the critical appraisal skills necessary to navigate complex and often unreliable health information landscapes [2,12].

The geographic analysis revealed that Japan, Australia, and several European nations particularly Norway, the United Kingdom, and Sweden are the most productive and influential contributors to CHL research. Norway's exceptionally strong international collaboration network, anchored by a multinational consortium of universities and public health institutes spanning Europe and sub-Saharan Africa, exemplifies the collaborative architecture that characterizes high-impact global health research. However, the marked underrepresentation of low- and middle-income countries in this corpus reflects a systemic knowledge asymmetry that must be addressed through targeted capacity-building, research funding, and inclusive publication practices if CHL scholarship is to serve the populations most vulnerable to health literacy deficits.

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Thematic analysis through keyword co-occurrence mapping identified ten research clusters encompassing 265 terms and 6,055 co-occurrence links. Dominant themes — including patient empowerment, health decision-making, instrument development, evidence-based practice, and digital health literacy reflect a field increasingly oriented toward practical application and measurement. The prominent role of digital health literacy within these clusters signals a paradigmatic convergence between CHL and the broader field of eHealth, suggesting that future conceptual frameworks for CHL will need to explicitly incorporate digital competencies as foundational rather than peripheral dimensions of health literacy [10,43].

The highly cited articles identified in this analysis further reinforce these thematic priorities, with top-cited works focusing on adolescent digital health literacy, chronic disease self-management, online health information seeking, and evidence-based health decision support. The consistent academic influence of Abel and Benkert's (2022) conceptual framework positioning CHL as a vehicle for individual reflection and collective action toward health equity affirms the enduring theoretical foundation upon which the field continues to build [7].

In conclusion, this study provides a comprehensive evidence base for researchers, health practitioners, educators, and policymakers seeking to understand the current state and future trajectory of CHL scholarship. The findings indicate that while significant progress has been made in building a robust international knowledge base, critical priorities remain: expanding CHL research into underserved geographic and demographic contexts, developing and validating culturally responsive measurement tools, and deepening the integration of CHL within digital health promotion policy and practice. Addressing these priorities will be essential to realizing the full potential of Critical Health Literacy as a lever for health equity and informed public health action in an increasingly complex information environment.

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