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A Decadal Bibliometric Analysis on the Therapeutic Strategies in Oral Lichen Planus

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ABSTRACT

Background and Aims: Oral Lichen Planus (OLP) is a common chronic inflammatory autoimmune illness that mostly affects the oral mucosa but may also affect other mucous membrane. It has higher prevalence in female patients of fourth to sixth decade of life with reticular being the commonest clinical variant. Clinical assessment, patient history, biopsy findings, and immunofluorescence were used to diagnose OLP. This study aimed to assess research publication trends in therapeutic strategies in the treatment of OLP, examining publication growth, country and institution contributions, and collaborative networks.

Methods: Using the Dimensions and Lens.org databases with Boolean operators combined the keywords a total of 40,046 peer-reviewed international publications were initially assessed. The article was selected from 2014 to December 2023. Through rigorous application of inclusion and exclusion criteria using an advanced search, a subset of 134 papers emerged to meet the high relevance standards. This subset, constituting a representative sample, was selected for in-depth bibliometric analysis.

Results and Conclusion: The result shows a clear upward trend in the number of publications, with a notable increase in 2018. After 2018, there is decrease in the number of publications, but it has an upward trend, reaching a peak of 215 in 2022. Chaitanya Nallan CSK leads the list of authors with four publications and a respectable total citation count of 12. Cairo University is the leading institution in this data set, with the 8 number of publications and 11 citations. The analysis revealed that at the top of the list is the "Egyptian Dental Journal" from Egypt, with six publications, four citations, and a link strength of two. In the second position is "BMC Oral Health" from the United Kingdom, with five publications, one citation, and a link strength of three. This study offers valuable insights for future research, clinical practice, and policy decisions.

Kumar Chandan Srivastava and Deepti Shrivastava contributed equally this study.

1 | Introduction

1.1 | Background of Oral Lichen Planus (OLP) as a Chronic Inflammatory Autoimmune Disorder Affecting the Oral Mucosa

OLP is a common chronic inflammatory autoimmune illness that mostly affects the oral mucosa but may also affect other mucous membrane tissues. It is known to affect about 0.2%–2% of the population across the world, with a known variation based on ethnicity [1]. In approximately 50% of the cases, it coexists with cutaneous LP [2]. The clinical features include white lace-like lesions, erythematous areas, and erosions. It may cause pain and impairment of oral health and quality of life. An insight into the etiopathogenesis of this autoimmune disorder will help to understand its sign and symptoms and subsequently its treatment [3].

OLP is considered an autoimmune illness; however, its etiology is unknown. It is caused by immune-mediated inflammation of the oral mucosa. Immune cells, especially T lymphocytes, penetrate mucosal membranes and cause inflammation. This immune reaction destroys the basal keratinocytes, which maintain the mucosal barrier. Thus, the oral mucosa develops white reticular lines, erythematous patches, and erosions [4, 5]. Genetic predisposition, viral diseases, such as hepatitis C, and environmental triggers may cause OLP. However, methods by which these variables trigger the OLP autoimmune response are still being studied [6].

Most of these lesions are seen in female patients in their fourth to sixth decade of life. However, the reversal in gender preponderance and children with OLP has been documented in certain populations [7]. The symptoms of OLP vary considerably. Common symptoms include reticular, erosive, atrophic, bullous, and plaque-like OLP. Clinical assessment, patient history, biopsy findings, and immunofluorescence were used to diagnose OLP. Histology shows subepithelial lymphocytic infiltration, which characterizes the disease. One of the important reasons for the biopsy is to evaluate the dysplastic changes. According to the World Health Organization (WHO), the erosive variant of OLP has been identified as a potentially malignant disorder (PMD) [8]. The malignant transformation rate of OLP ranges from 0.44% to 2.28% based on recent studies, with an increased risk of malignant changes in erosive and/or atrophic lesions, tongue lesions, patients with higher intake of alcohol/tobacco, and an accompanying hepatitis C virus infection [9]. Symptom relief and the prevention of complications are the main goals of OLP treatment. Therapeutic methods include topical corticosteroids, immunomodulators, oral hygiene, and avoiding triggers [4].

1.2 | Importance of Therapeutic Strategies in the Management of OLP

Therapeutic techniques for treating OLP are crucial. It is a chronic inflammatory autoimmune condition that affects the oral mucosa and may cause pain, discomfort, and poor oral health and quality of life. Therapeutic approaches to OLP vary. Healthcare providers can customize therapy based on case severity and clinical presentation. This tailored strategy improves the results and reduces adverse effects. Patient education regarding the illness, its causes, and treatment adherence is part of therapy. Successful OLP treatment and long-term control require patient participation and comprehension [10].

The first and foremost principle in management is the accurate diagnosis of the lesion. Although the diagnosis is aided by the available diagnostic criteria, the experience of the clinician plays a crucial role [11]. Identification and elimination of precipitating factors are of utmost importance. The treatment goals include relieving the symptoms, remission of the lesion, preventing its recurrence, and malignant transformation. Identification and elimination of precipitating factors are of utmost importance. The treatment goals include relieving the symptoms, remission of the lesion, preventing its recurrence, and malignant transformation. Patients with OLP need effective treatment to manage symptoms, avoid complications, and improve their health. It may cause subsequent infections, scarring, and irreparable oral mucosa damage if neglected [12]. The lesions can impair eating, swallowing, and speech. Reducing pain and improving comfort may improve dental health and function, and therapeutics may reduce inflammation, control immunological responses, and heal the mucosa to prevent these consequences. The clinical characteristics of OLP might distort the physical appearance, and it could cause a physiological impact on patients. Therapeutic methods are used to treat physical symptoms and reduce anxiety, sadness, and other psychological repercussions of persistent mouth pain. It increases the risk of oral cancer marginally but is uncommon. Therapeutic care and surveillance may reveal early malignant transformation, increasing the results. The common therapeutic agents used for treating OLP are corticosteroids, retinoids, immunosuppressive drugs, and UV-phototherapy [13]. Corticosteroids are the first line of treatment, as their usage has shown a promising outcome in the majority of cases [14]. Generally, topical corticosteroids (TCs) of low-intermediate potency are prescribed, such as triamcinolone acetonide 0.1% cream [15]. In cases where lesions are becoming recalcitrant, high-potency TCs such as 0.01% clobetasol propionate are prescribed [16]. When stronger TCs, like Clobetasol at 0.5% concentration, are used in an aqueous mouthwash or orabase preparation, the candidal infection happens more often. It is advised to either use mild-moderate TCs or a lower concentration of high-potency TCs (0.025% Clobetasol propionate), or sometimes simultaneous application of antifungal therapy with nystatin is done to avoid oral thrush [14, 15]. Another medicament, such as retinoids, is also given for the management of OLP. The pharmacological action of retinoids, including epithelial growth and differentiation, suppression of tumorgenic genes, and modulation of inflammatory T cells, is believed to be beneficial in the treatment of OLP. However, very few controlled trials have been conducted to substantiate its efficacy. Immunosuppressive drugs such as calcineurin inhibitors, namely tacrolimus and cyclosporine mouthwash, are considered in chronic cases. Apart from pharmacological agents, psoralens and long-wave ultraviolet-A (PUVA) are also instituted as treatment tools for cutaneous as well as oral lesions, with a success rate of 81.2% in OLP patients [15]. However, side effects may vary from mild to severe and even pose greater risk of development of oral cancer. Surgical management include

cryosurgery and photodynamic therapy CO2-laser therapy have been recommended though the chance of recurrence may be encountered.

In conclusion, therapeutic strategies are essential for effective management of the OLP. They provide relief from symptoms, prevent complications, enhance oral function, address psychosocial impacts, and contribute to a better quality of life for individuals living with OLP. A multidisciplinary approach involving health care professionals, patient education, and ongoing research is key to achieving successful outcomes in the management of this challenging condition.

1.3 | Purpose of the Bibliometric Study in Examining the Scientific Landscape of Therapeutic Strategies in OLP

A bibliometric study examining the scientific landscape of therapeutic strategies in OLP serves numerous crucial purposes. It assesses research trends over time and identifies active contributors, institutions, and research topics, thus facilitating collaboration and recognizing key leaders. By quantifying the research output and analyzing citations, it gauges the impact and relevance of OLP therapeutic research and informs resource allocation. This study also helps benchmark individual research efforts, fosters improvement, and aids policymakers in evidence-based decision-making. Ultimately, bibliometrics in OLP therapeutics provides a data-driven understanding that advances research, clinical practice, and healthcare policy in the field.

2 | Methodology

2.1 | Selection of the Bibliographic Database

Bibliometric analysis focuses on exploring therapeutic strategies for OLP within the indexed literature. This method involves the statistical examination of publishing trends, patterns, and the overall scope of academic publications in this field. It is worth noting that the Dimensions database, recognized as a reputable and globally recognized indexing and abstracting database, serves as the authoritative source for this research.

2.2 | Inclusion and Exclusion Criteria for Selecting Relevant Articles

In this study, we set precise inclusion and exclusion criteria to direct our literature search for treatment approaches for OLP.

2.2.1 | Inclusion Criteria

We concentrated on identifying peer-reviewed English-language original research articles and reviews published between 2014 and 2023. These papers have to provide sufficient bibliographical details, such as the names of the authors, the article's title, its abstract, its publishing year, and its original publication.

2.2.2 | Exclusion Criteria

On the other hand, editorials, opinions, book chapters, letters, conference proceedings, or abstracts that were not peer-reviewed were excluded. Articles written after 2014 with insufficient bibliographic details, not available in a full-text format, and not publicly available as open access were also excluded from our evaluation. This stringent set of requirements ensured that our study was based on a reliable and relevant literature search for the management of OLP.

2.3 | Search Strategy Using Appropriate Keywords and Boolean Operators

As shown in Figure 1, a comprehensive four-phase approach was devised to select articles for bibliometric analysis according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guideline (citation). The methodology involved a meticulous search and selection process that integrated specific keywords for optimal results. The keywords are: “therapeutics”, “therapeutic”, “treatment”, “treatmepolnts”, “management”, “therapies”, “therapy”, “interventions”, “intervention”, “strategies”, “strategy”, and “oral lichen planus”. The query employed Boolean operators “AND” and “OR” to combine keywords effectively.

The choice of the dimension database field was strategic, aiming to encompass a broad range of relevant entries and to ensure maximum inclusion and recall. Initially, a database search identified 40,046 peer-reviewed international publications. Through rigorous application of inclusion and exclusion criteria using an advanced search, a subset of 134 papers emerged to meet the high relevance standards. This subset, constituting a representative sample, was selected for in-depth bibliometric analysis.

2.4 | Data Extraction Process, Including Information on Authorship, Publication Year, Journal, and Citation Count

The data for this study were gathered from the Dimensions and Lens.org databases, which are both renowned repositories of high-quality academic publications and interconnected research content. To construct and visualize bibliometric networks, including research clusters, current trends, and emerging subject areas, we employed the free software tool VOSviewer. These networks can be constructed based on various factors, such as citations, scientific co-authorship, co-occurrence of terms, co-citation of articles, and bibliographic connections. We analysed and visually represented data from 134 [12–149] relevant publications on therapeutic strategies in OLP using VOSViewer software.

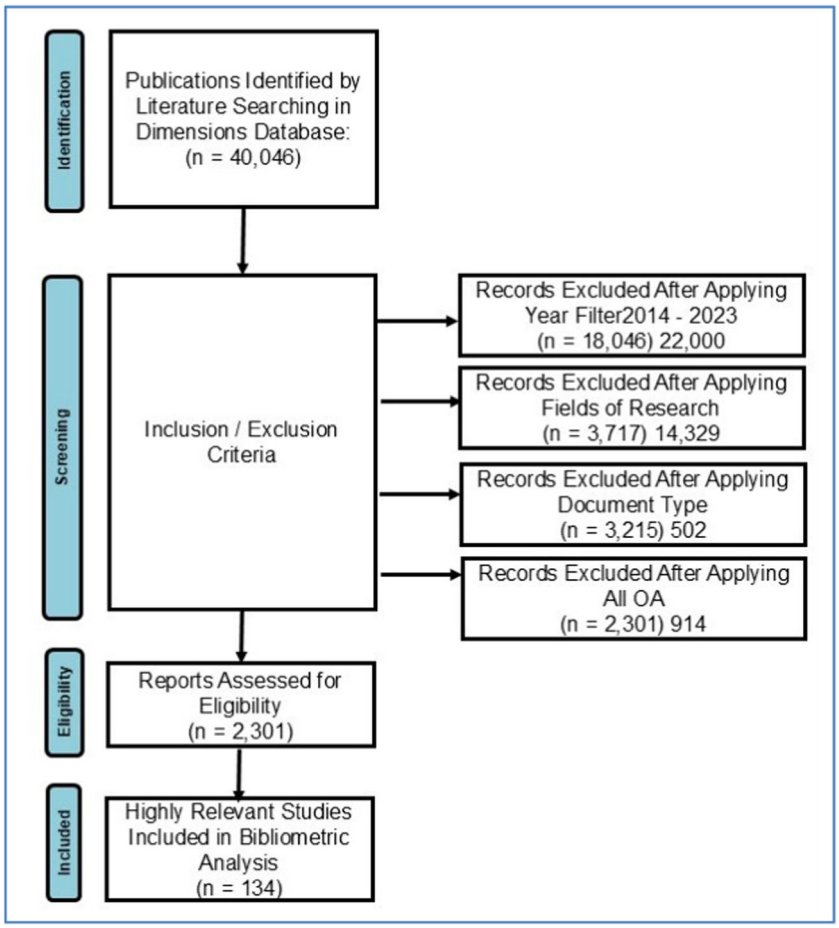

FIGURE 1 | Diagram of PRISMA in four stages.

3 | Analysis of Publication Trends

3.1 | Overall Publication Output on Therapeutic Strategies in OLP Over a Specified Time Period

The output states that between 2014 and 2023, 40,046 publications were identified through systematic literature searches in the Dimensions Database. These publications revolve around therapeutic strategies for OLP, a chronic inflammatory condition affecting the mucous membranes of the mouth. This significant number of publications reflects substantial interest and research activity in the field, indicating ongoing efforts by researchers, clinicians, and healthcare professionals to improve our understanding of OLP and develop effective treatment approaches to alleviate its symptoms and manage the condition.

3.2 | Distribution of Publications Across Different Years and Comparison of Trends

Figure 2 (using R Studio) presents the trend chart and illustrates the total number of publications over the years from 2014 to 2023. The chart shows a clear upward trend in the number of publications, with a notable increase in 2018. After 2018, there is decrease in the number of publications, but it has an upward trend, reaching a peak of 215 in 2022. However, by 2023, there was a slight decline to 131 publications. This analysis provides insight into publication trends over the past decade, highlighting the substantial growth in publications, particularly in recent years.

3.3 | Analysis of Publication Productivity of Different Authors and Institutions

Table 1 shows the analysis conducted using VOSviewer software, and a group of 17 authors was identified from a larger pool of 646 based on specific inclusion criteria: a minimum of 2 documents and 2 citations each. These authors were ranked according to their total publications, total citations, and total link strength, with the top 10 listed in the table. The analysis of publication productivity among various authors revealed a diverse range of academic outputs and impacts. Chaitanya Nallan CSK leads the list with four publications and a respectable total citation count of 12, indicating a reasonable level of influence in their field. Ameer Shaik follows closely with two publications and five citations, demonstrating a strong link strength despite a lower publication count. Maryam Amirchaghmaghi and Junjun Chen also have two publications each, with Maryam boasting a substantial total citation count of 37, showcasing her significant impact in the academic community. Other authors like Dario Didona, Guanhuan Du, and Michael Hertl have two publications each with moderate citation counts, reflecting their contributions to their respective fields. However, some authors, such as Amal A. Hussine and T.N. Uma Maheswari,

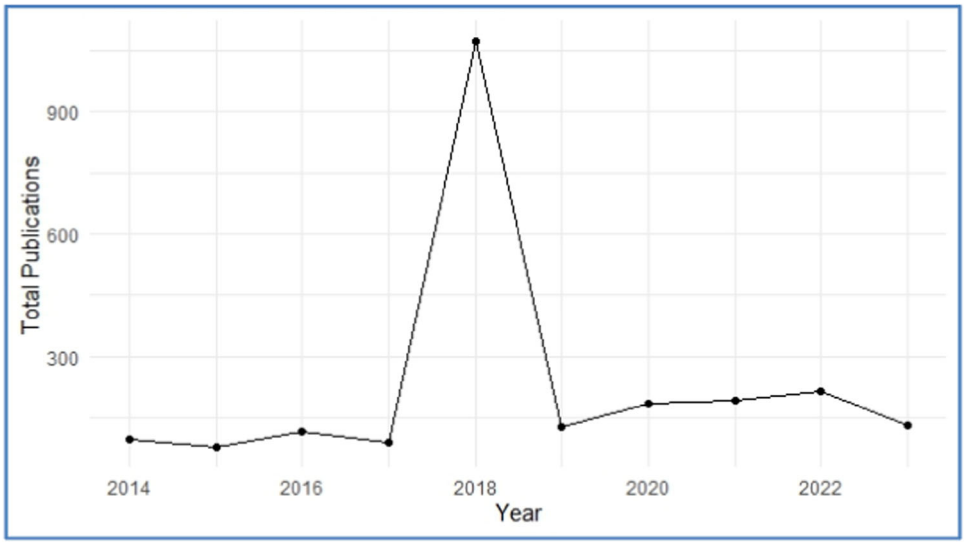

FIGURE 2 | Publication output overview 2014–2023.

TABLE 1 | Top authors from selected publications.

Rank	Author's name	Total publication	Total citations	Total link strength
1	Chaitanya, Nallan CSK	4	12	4
2	Ameer, Shaik	2	5	4
3	Amirchaghmaghi, Maryam	2	37	2
4	Chen, Junjun	2	20	2
5	Didona, Dario	2	8	2
6	Du, Guanhuan	2	20	2
7	Hertl, Michael	2	8	2
8	Hussine, Amal A.	2	2	0
9	Maheswari, T. N. Uma	2	17	0
10	Mozaffari, Hamidreza	2	12	0

and Hamid Reza Mozaffari have two publications but lower or no citations, indicating a need for increased visibility and recognition in their areas of research. Overall, this analysis underscores the variability in publication productivity and impact among these authors.

Table 2 presents the analysis of publication productivity using VOSviewer software; 161 institutions were initially considered, but after imposing minimum thresholds of 2 documents and 2 citations, 28 institutions met the criteria. The analysis of publication productivity among various institutions revealed a diverse landscape in terms of research output and impact. Cairo University is the leading institution in this dataset, with the highest number of publications (8) and a moderate level of citations (11), earning it the top rank. Notably, it also had the highest link strength, indicating a significant influence on the academic community. In contrast, Dr. NTR University of Health Sciences, despite having a substantial number of citations (46), ranks second, with fewer publications (5) and a link strength of 0, suggesting a need for further research dissemination and visibility. Other institutions, such as Mashhad University of Medical Sciences and Tehran University of Medical Sciences, demonstrate a balance between publications and citations, with the former having a slightly higher link strength due to its comparable citation count. Shanghai Jiao Tong University, Shanghai Ninth People's Hospital, and Tehran University of Medical Sciences share the highest link strength of the three, showcasing their strong influence and research collaboration. Overall, this analysis highlights variations in research productivity, impact, and collaboration among listed institutions, emphasizing the importance of both quantity and quality in academic research endeavors.

4 | Journal and Citation Analysis

4.1 | Identification of Journals Publishing the Highest Number of Articles on Therapeutic Strategies in OLP

Table 3 shows a bibliometric analysis of 99 sources related to therapeutic strategies in OLP. By setting the minimum thresholds of one document and one citation for each source,

TABLE 2 | Top institutions from selected publications.

Rank	Institution's name	Total publication	Total citations	Total link strength
1	Cairo University	8	11	1
2	Dr. NTR University of Health Sciences	5	46	0
3	Alexandria University	4	9	0
4	Mashhad University of Medical Sciences	4	56	1
5	Tehran University of Medical Sciences	4	41	3
6	Ain Shams University	3	5	2
7	Kermanshah University of Medical Sciences	3	18	1
8	Shanghai Jiao Tong University	3	24	3
9	Shanghai Ninth People's Hospital	3	24	3
10	Sichuan University	3	19	0

TABLE 3 | Top journals publishing the highest number of articles.

Rank	Journals	Total publication	Total citations	Total link strength	Country
1	Egyptian Dental Journal	6	4	2	Egypt
2	BMC Oral Health	5	1	3	UK
3	Journal of Dental Sciences	4	25	2	Taiwan
4	Indian Journal of Dental Research	3	32	2	India
5	Journal of Oral and Maxillofacial Pathology	3	27	4	India
6	Medicina Oral Patología Oral Y CirugiaBucal	3	26	4	Spain
7	Journal of Oral Biology and Craniofacial Research	3	19	1	Netherlands
8	International Journal of Environmental Research and Public Health	3	18	2	Switzerland
9	Clinical and Experimental Dental Research	3	12	1	US
10	Alexandria Dental Journal	3	8	2	Egypt

83 sources met the criteria. The analysis revealed that at the top of the list is the "Egyptian Dental Journal" from Egypt, with six publications, four citations, and a link strength of two. In the second position is "BMC Oral Health" from the United Kingdom, with five publications, one citation, and a link strength of three. "Journal of Dental Sciences" from Taiwan holds the third spot with four publications and a remarkable 25 citations, along with a link strength of two. "Indian Journal of Dental Research" and "Journal of Oral and Maxillofacial Pathology" from India come in fourth and fifth place, respectively, both showing three publications and substantial citations. Spain's "Medicina Oral Patología Oral Y CirugiaBucal" also has three publications but stands out with 26 citations and a link strength of four. The remaining journals on the list include those from the Netherlands, Switzerland, the United States, and another from Egypt, each with three publications and varying citation and link strength values. It is important to note that while this ranking provides some insights into these journals, a more comprehensive assessment would consider additional factors like impact factors, peer review processes, and the specific research areas covered.

4.2 | Assessment of Journal Impact Factors and Citation Rates of Published Articles

Table 4 VOS viewer software was used to look at the journal impact factors and citation rates of published articles from a set of 99 sources, with each source having to have at least one document and one citation. Among the 99 sources, 83 met the thresholds. The assessment of journal impact factors and citation rates for listed journals reveals a varied landscape within the field of biomedical and dental research. Notably, the Journal of Biomedical Optics stands out with a high number of citations (50) and a strong impact factor (3.582), placing it in the top quartile (Q1) based on the SJR ranking. On the other hand, the Journal of Dental Research Dental Clinics Dental Prospects has a relatively low impact factor (0.1) and is ranked in the third quartile (Q3). The Journal of Translational Medicine boasts an exceptionally high impact factor (8.448) and a Q1 ranking. Other journals, such as the Chonnam Medical Journal and Journal of Clinical Medicine Research, have notable citation counts, but their impact factors and SJR rankings are relatively lower. The Indian Journal of Dental Research and Journal of Oral and Maxillofacial Pathology fall in the third quartile (Q3)

according to the SJR ranking, but their impact factors are relatively moderate. In contrast, the European Journal of Dentistry and Brazilian Oral Research enjoy high impact factors and Q1 and Q2 rankings, respectively. Lastly, Medicina Oral Patología Oral Y CirugiaBucal is positioned in the second quartile (Q2) with a respectable impact factor (2.047). These metrics offer valuable guidance to researchers, assisting them in making informed decisions when selecting journals for publication or referencing in their studies.

TABLE 4 | Top journals of impact factors and citation rates.

Rank	Journals	Total publication	Total citations	Total link strength	Impact factor (IF)	SJR ranking
1	Journal of Biomedical Optics	1	50	6	3.5	Q1
2	Chonnam Medical Journal (No IF)	1	43	3	1.3	—
3	Journal of Clinical Medicine Research (No IF)	1	36	1	2.67	Q2
4	Journal of Dental Research Dental Clinics Dental Prospects	1	35	3	0.1	Q3
5	European Journal of Dentistry (No IF)	1	32	1	0.622	Q1
6	Indian Journal of Dental Research (No IF)	3	32	2	1.088	Q3
7	Journal of Translational Medicine	1	31	0	7.4	Q1
8	Brazilian Oral Research	1	30	3	2.5	Q2
9	Journal of Oral and Maxillofacial Pathology (No IF)	3	27	4	1.22	Q3
10	Medicina Oral Patología Oral Y CirugiaBucal (No IF)	3	26	4	2.047	Q2

4.3 | Identification of Highly Cited Articles in the Field

Table 5 analyze highly cited articles in a specific field using VOSviewer software with a minimum citation threshold of 1 and considering 103 sources meeting the criteria. These articles have garnered significant attention and citations within the scientific community, indicating their importance in advancing the understanding of OLP. Leading the list is the article by Dillenburg, which compares the efficacy of laser phototherapy with topical clobetasol in treating the condition. This study, published in 2014 and cited 50 times, highlights the significance of exploring alternative treatment approaches. Another study by Abdolsamadi, also from 2014, investigates salivary antioxidant vitamins and lipid peroxidation in patients with OLP, garnering 43 citations. In third place, Mostafa's 2015 publication explores the use of photodynamic therapy in treating OLP, which has received 36 citations. Similarly, Amirchaghmaghi's research, published in the same year, conducts a randomized placebo-controlled clinical trial using quercetin for treatment, with 35 citations. The fifth-ranked article by Sridevi, also from 2015, examines the expression of E-cadherin in different oral conditions, including lichen planus, and has been cited 32 times. Ding's 2017 study, in sixth place with 31 citations, delves into the distinct expression profile of HCMV-encoded miRNAs in plasma from OLP patients. Humberto's systematic review in 2018, ranking seventh with 30 citations, investigates cytokines, cortisol, and nitric oxide as salivary biomarkers in OLP. In eighth place, Rekha's 2017 publication has garnered 23 citations by evaluating oxidative stress markers in OLP patients. Amanat's study from 2014, in ninth place with 22 citations, compares the effects of cryotherapy with nitrous oxide gas to topical corticosteroids for treating OLP. Finally, the tenth-ranked article by Chen, published in 2017 and cited 20 times, provides preliminary results of an integrative analysis of mRNA and miRNA expression profiles in OLP. These highly cited articles collectively contribute to the comprehensive understanding of OLP, its treatment options, potential biomarkers, and molecular factors, benefiting researchers and healthcare professionals in the field of oral medicine and dentistry.

5 | Author and Institution Analysis

5.1 | Identification of Most Productive and Influential Authors in the Field

Table 6 using VOSviewer software with a dataset of 646 sources in a specific field, the authors were filtered based on a minimum of 2 documents and 2 citations. In the field under consideration, Maryam Amirchaghmaghi and Mohammad

TABLE 5 | Top highly cited articles in the field (TC: total citation).

Rank	Title	Articles	TC	TLS	Year
1	Efficacy of laser phototherapy in comparison to topical clobetasol for the treatment of oral lichen planus: a randomized controlled trial	Dillenburg [66]	50	5	2014
2	Levels of Salivary Antioxidant Vitamins and Lipid Peroxidation in Patients with Oral Lichen Planus and Healthy Individuals	Abdolsamadi [94]	43	3	2014
3	Photodynamic Therapy in Treatment of Oral Lichen Planus	Mostafa [76]	36	1	2015
4	A Randomized Placebo-controlled Double Blind Clinical Trial of Quercetin for Treatment of Oral Lichen Planus	Amirchaghmaghi [107]	35	2	2015
5	Expression of E-cadherin in normal oral mucosa, in oral precancerous lesions and in oral carcinomas	Sridevi [105]	32	1	2015
6	Distinct expression profile of HCMV encoded miRNAs in plasma from oral lichen planus patients	Ding [99]	31	0	2017
7	Cytokines, cortisol, and nitric oxide as salivary biomarkers in oral lichen planus: a systematic review	Humberto [64]	30	3	2018
8	Evaluation of oxidative stress markers in oral lichen planus	Rekha [98]	23	3	2017
9	Comparing the effects of cryotherapy with nitrous oxide gas versus topical corticosteroids in the treatment of oral lichen planus	Amanat [68]	22	0	2014
10	Integrative analysis of mRNA and miRNA expression profiles in oral lichen planus: preliminary results	Chen [106]	20	0	2017

TABLE 6 | Most productive and influential authors in the field.

Rank	Author's name	Total publication	Total citations	Total link strength
1	Amirchaghmaghi, Maryam	2	37	2
2	Shakeri, Mohammad Taghi	2	37	2
3	Chen, Junjun	2	20	2
4	Du, Guanhuan	2	20	2
5	Maheswari, T.N. Uma	2	17	0
6	Chaitanya, Nallan CSK	4	12	4
7	Mozaffari, Hamid Reza	2	12	0
8	Popovska, Mirjana	2	10	2
9	Radojkova-Nikolovska, Vera	2	10	2
10	Thongprasom, Kobkan	2	9	0

Taghi Shakeri have emerged as the most productive authors, each with two publications and a substantial total of 37 citations, indicating their significant impact on the research community. However, their link strength was relatively low, suggesting that their influence may not be deeply interconnected with other researchers in the field. Nevertheless, Nallan Csk Chaitanya, with four publications and a link strength of 4, stands out as highly productive and influential, indicating a strong network presence within the research community. While other authors have also contributed meaningfully, these rankings provide a snapshot of productivity and influence based on the available data.

5.2 | Analysis of Collaboration Patterns Among Authors and Institutions

5.2.1 | Collaboration Patterns Among Authors

Figure 3 shows the analysis using VOSviewer software that delves into collaboration patterns among authors based on a minimum inclusion criterion of one document and one citation for each author of the 646 sources in the dataset, 522 met these thresholds, ensuring the involvement of authors with at least one publication or citation. The analysis identified three distinct clusters showing collaborative relationships among the authors. These clusters shed

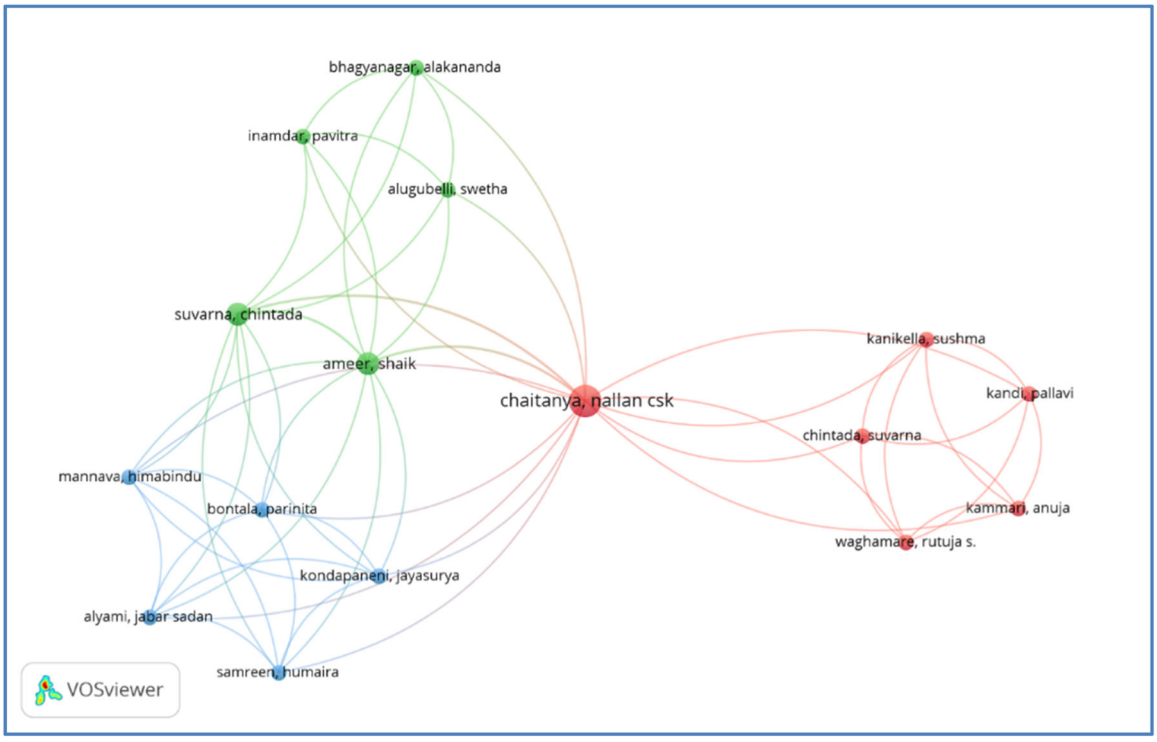

FIGURE 3 | Collaboration patterns among authors.

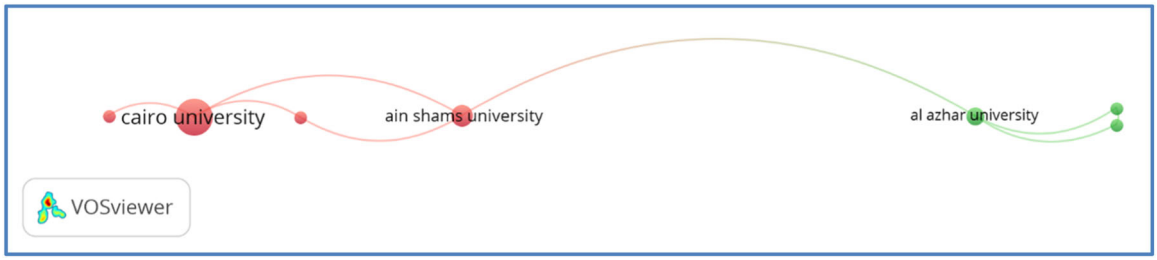

FIGURE 4 | Collaboration patterns among institutions.

light on groups of authors with strong collaboration or thematic similarities in their work. In total, 55 links among the authors were detected, illustrating the connections formed through co-authorship. The overall strength of these connections, which represents collaboration intensity, was quantified as a total link strength of 58. This analysis provides a valuable understanding of collaboration structures, influential authors, and emerging trends within the academic community, aiding potential research partnerships and assessing scholarly impact. There three clusters. Cluster 1 consists of 6 items Chaitanya, Nallan CSK; Chintada, Suvarna; Kammari, Anuja; Kandi, Pallavi; Kanikella, Sushma; and Wagahmare, Rutujas. Cluster 2 consisted of five items: Algbelli, Swetha; Ameer, Shaik; Bhagyanagar, Alakanda; Inmdar, Pavitra; and Suvarna, Chintada. Cluster 3 consist Alyami, Jabarsadan; Bontala, Parinita; Kondapaneni, Jayasurya; Mannava, Himabindu; and Samreen, Humaira.

5.2.2 | Collaboration Patterns Among Institutions

Figure 4 presents an analysis of collaboration patterns among institutions conducted using the VOSviewer software with specific criteria. a minimum of one document and 1 citation of the initial 161 sources, 132 met the thresholds. Within this dataset, seven distinct organizations were identified as actively engaged in research or collaboration. Further examination revealed 2 clusters, indicating groups of organizations with shared characteristics or strong connections. Additionally, 8 links were detected, representing collaborative relationships between some organizations. This analysis offers a visual representation of collaboration patterns, revealing the structure of collaborations, key players, and interconnections among institutions in the chosen research field, providing valuable insights for researchers, institutions, and policymakers interested in understanding research networks and partnerships.

Cluster 1 comprises four institutions: Ain Shams University, Cairo University, the National Research Centre, and the University of Aden. Cluster 2 consisted of three institutions: Ahram Canadian University, Al-Azhar University, and Badr University in Cairo. These clusters represent groups of organizations with shared characteristics or strong collaboration patterns within the dataset, providing valuable insights

TABLE 7 | Top authors from selected publications.

Rank	Author's name	Total publication	Total citations	h-index (based on Google scholar? Scopus? Web of Science?)	Citation impact
1	Chaitanya, Nallan CSK	4	12	2	3.0
2	Ameer, Shaik	2	5	2	2.5
3	Amirchaghmaghi, Maryam	2	37	2	18.5
4	Chen, Junjun	2	20	2	10.0
5	Didona, Dario	2	8	2	4.0
6	Du, Guanhuan	2	20	2	10.0
7	Hertl, Michael	2	8	2	4.0
8	Hussine, Amal A.	2	2	2	1.0
9	Maheswari, T.N. Uma	2	17	2	8.5
10	Mozaffari, Hamidreza	2	12	2	6.0

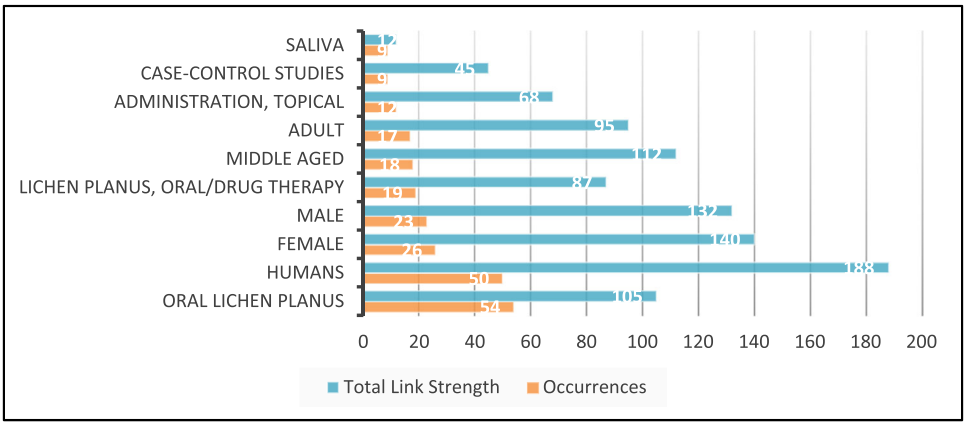

FIGURE 5 | Top frequently used keywords in selected articles.

into the networks and partnerships among these institutions in the field of research.

5.3 | Assessment of Author h-Index and Citation Impact

Table 7 shows the analysis conducted using VOSviewer software, and a group of 17 authors was identified from a larger pool of 646 based on specific inclusion criteria: a minimum of 2 documents and 2 citations each. In this dataset, the highest h-index achieved by any author is 2, indicating that each author has published at least 2 papers, each of which has garnered at least 2 citations. When it comes to assessing citation impact, we observed notable variations among the authors. Maryam Amirchaghmaghi has the highest citation impact, with an average of 18.5 citations per publication, followed closely by Guanhuan Du and Junjun Chen, both with 10 citations per publication. Uma T.N. Maheswari and Hamid Reza Mozaffari have an average of 8.5 and six citations per publication, respectively. Nallan CSK Chaitanya has a lower citation impact of 3 citations per publication, whereas Dario Didona and Michael Hertl have an average of 4 citations per publication. Shaik Ameer receives an average of 2.5 citations per publication and Amal A. Hussine receives 1 citation per publication. These figures offer insights into the varying degrees of impact and recognition within this group of authors, based on their publication and citation records.

6 | Keyword and Co-Occurrence Analysis

6.1 | Identification of Most Frequently Used Keywords in the Titles and Abstracts of the Selected Articles

In Figure 5, using VOSviewer software, 17 out of the 436 selected articles met the threshold of keywords that occurred at least 6 times in their titles and abstracts, and these frequently occurring keywords were analyzed for bibliometric insights.

The most frequently used keywords in the titles and abstracts of selected articles on OLP provided a comprehensive overview of the research focus. The OLP itself emerges as a central topic with 54 occurrences and a total link strength of 105, highlighting its significance in these studies. Additionally, the

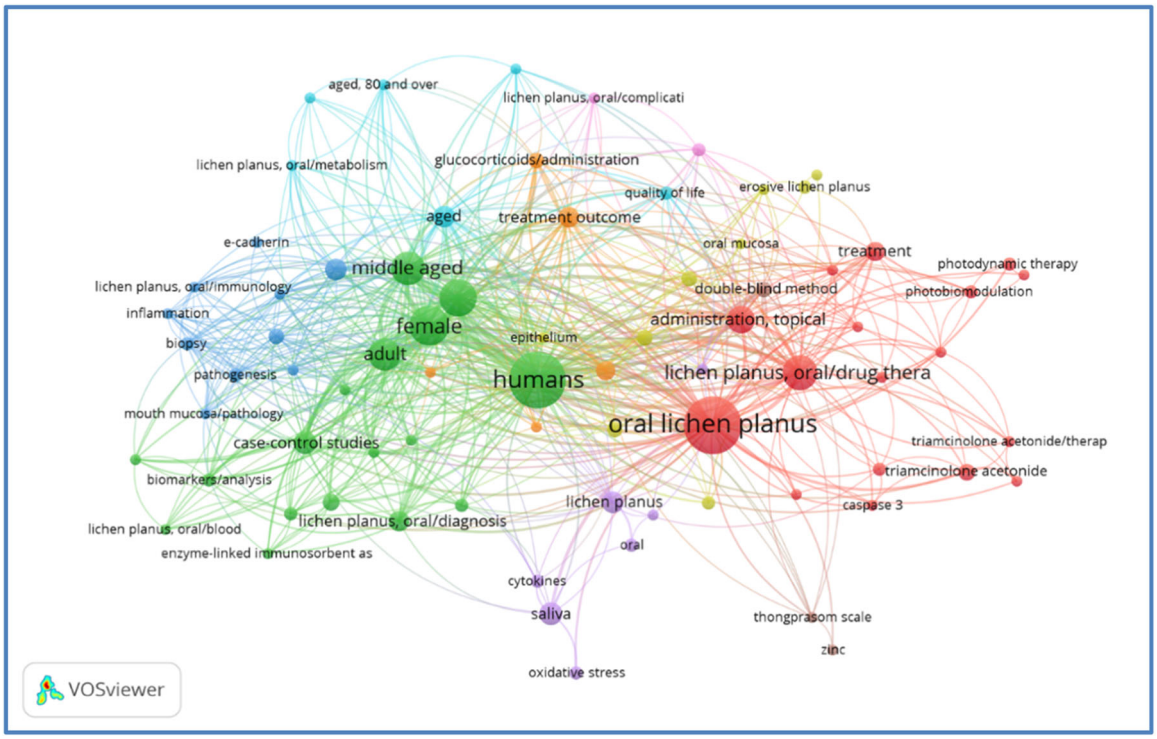

FIGURE 6 | Keyword co-occurrence patterns.

inclusion of keywords like "female" and "male" suggests an investigation into gender-specific aspects of OLP, potentially examining differences in prevalence or treatment responses. "Lichen Planus, Oral/Drug Therapy" signifies a substantial focus on drug treatments for OLP. Furthermore, terms such as "middle-aged" and "adult" provide insights into the age demographics of the study participants, while "administration, topical" indicates an exploration of topical treatment modalities. The presence of "case-control studies" implies a research design aimed at identifying risk factors, and the keyword "saliva" suggests an investigation into the relationship between OLP and salivary factors. Together, these keywords collectively define the scope and themes of the selected articles, showcasing a multifaceted approach to understanding and managing OLP in human subjects.

6.2 | Analysis of Keyword Co-Occurrence Patterns to Identify Research Clusters and Trends

Figure 6 shows the analysis conducted using the VOSviewer software on a dataset of 436 sources, with a minimum keyword occurrence threshold of 2, yielding 76 sources that met the criteria. Within this subset, 9 research clusters were identified based on keyword co-occurrence patterns. Cluster 1 and Cluster 2 are the largest, each comprising 17 sources, followed by Cluster 3 with 10 sources, cluster 4 with 9 sources, Cluster 5 with 7 sources, and smaller clusters, including Cluster 7 with 5 sources, Cluster 8 with 3 sources, and Cluster 9 with just 2 sources. In total, 637 links indicated co-occurring keywords, with a cumulative link strength of 1361, revealing various levels of association among keywords across the dataset. This analysis provides valuable insights into the underlying research themes and trends within the dataset, aiding the identification of dominant and specialized areas of study.

6.3 | Mapping of Keyword Networks to Visually Represent the Relationships Among Different Research Areas

Figure 7 shows that in the mapping of keyword networks using the VOSviewer software, 241 sources were analyzed with a minimum keyword occurrence threshold of 1. All 241 sources met this requirement, resulting in a network comprising 241 items grouped into 20 clusters connected by 1939 links, with a total link strength of 2517. Cluster sizes varied, with Cluster 1 being the largest with 21 items, followed by Clusters 2 and 3 with 19 and 18 items, respectively. Cluster 4 is also substantial with 16 items, while Clusters 19 and 20 are smaller, consisting of 3 and 2 items, respectively. This network visualization provides a comprehensive overview of the relationships between research areas, with the clusters and links offering insights into the structure of the research landscape and the interconnections among various topics.

7 | Analysis of Therapeutic Strategies

7.1 | Categorization of Therapeutic Strategies Based on the Identified Articles

Table 8 presents the data based on the identified top 10 articles [64, 66, 68, 76, 94, 98, 99, 105–107], therapeutic strategies for treating OLP, can be categorized them into several broad following categories: Therapeutic strategies for OLP encompass a range of approaches. Pharmacological interventions include

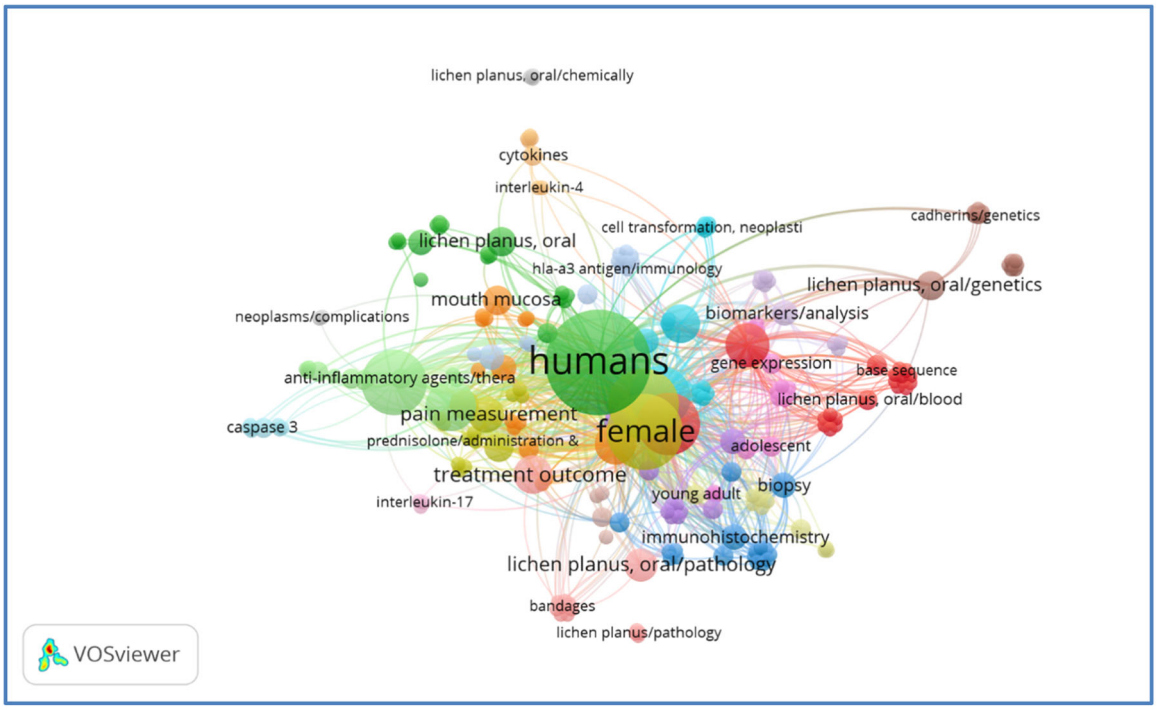

FIGURE 7 | Mapping of keyword networks.

TABLE 8 | Categorization of therapeutic strategies.

Category	Therapeutic strategies
Pharmacological interventions	– Corticosteroids (topical and systemic)
	– Immunomodulatory agents (e.g., cyclosporine, tacrolimus)
	– Targeted therapies (based on gene and miRNA targets)
Non-pharmacological interventions	– Lifestyle modification (stress reduction, dietary changes)
	– Oral hygiene management
Topical treatments	– Topical corticosteroids
	– Topical retinoids
	– Calcineurin inhibitors
Phototherapy	– Ultraviolet (UV) light therapy (UVA, NB-UVB)
	– Laser phototherapy
Antioxidant therapy	– Antioxidant supplementation (e.g., vitamins A, C, E)
	– Oxidative stress reduction (lifestyle modifications)
Standard treatment	– Dexamethasone mouthwash and nystatin suspension
Experimental treatment	– Quercetin hydrate capsules
Other	– Cryotherapy with nitrous oxide gas

corticosteroids (topical and systemic), immunomodulatory agents, such as cyclosporine and tacrolimus, and targeted therapies based on gene and miRNA targets. Non-pharmacological methods involve lifestyle modifications and oral hygiene management. Topical treatment includes corticosteroids, retinoids, and calcineurin inhibitors. Phototherapy with ultraviolet (UV) light or lasers, as well as antioxidant therapy with vitamins A, C, and E, can also be employed. Standard treatment includes dexamethasone mouthwash and nystatin suspension, whereas experimental options such as quercetin hydrate capsules and cryotherapy with nitrous oxide gas offer alternative avenues for management.

7.2 | Quantitative Assessment of the Prevalence and Effectiveness of Different Therapeutic Approaches

Table 9 presents the data based on the identified top 10 articles [64, 66, 68, 76, 94, 98, 99, 105–107]. The quantitative assessment

TABLE 9 | Quantitative assessment of the prevalence and effectiveness of different therapeutic approaches.

Category	Quantitative assessment	Description
Assessment of lesion severity	Clinical Scores (CS)	Severity of lesions on a scale from 0 (no lesions) to 5 (erosive area > 1 cm^2)
	Severity Index (SI)	Quantify the severity of erosive and atrophic lesions
	Erosion Size	Measure and grade the maximum diameter of erosive and atrophic lesions
Assessment of symptom relief	Pain Index (PI)	Quantify pain or burning sensation using a visual analog scale (VAS)
	Beck Anxiety Inventory (BAI) Scores	Assess patients' anxiety levels using BAI scores
Functional impact assessment	Functional Scores	Assess chewing function, swallowing, fluid intake, and altered sense of taste
Treatment outcome evaluation	Clinical Resolution (CR)	Categorize resolution as complete, partial, or no response
	Recurrence Rates (RR)	Analyze recurrence rates at Days 60 and 90
Safety and systemic effects	Systemic Cortisol Levels	Monitor systemic cortisol levels in the clobetasol group
Research approaches	Longitudinal Studies	Initiate long-term observational studies to monitor patients undergoing different therapies
	Retrospective Analysis	Analyze patient records, treatment approaches, duration, and outcomes in a larger cohort
	Clinical Trials	Conduct randomized controlled trials (RCTs) comparing therapeutic approaches

of the prevalence and effectiveness of different therapeutic approaches for OLP is important, and the quantitative assessment of the prevalence and effectiveness of various therapeutic approaches involves a multifaceted approach. Clinical Scores (CS), Severity Index (SI), and Erosion Size measurements allow for precise evaluation of lesion severity, aiding in treatment decision-making. Pain Index (PI) and Beck Anxiety Inventory (BAI) scores gauge symptom relief and psychological well-being. Functional Scores provide insight into their impact on daily life. Clinical Resolution (CR) and recurrence rate (RR) were used to assess treatment outcomes and long-term effectiveness. Monitoring Systemic Cortisol Levels ensures safety. Research methods include longitudinal studies, retrospective analyses, and clinical trials to comprehensively analyze therapies and guide evidence-based healthcare decisions.

7.3 | Identification of Emerging and Innovative Therapeutic Strategies in the Field

Based on the identified top 10 articles [64, 66, 68, 76, 94, 98, 99, 105–107], emerging and innovative therapeutic strategies for OLP encompass a range of approaches. These include Laser Phototherapy (LPT), which offers non-invasiveness and minimal side effects compared to traditional treatments, as well as the potential effectiveness of corticosteroids. Nanotechnology-Based Therapies aim to enhance treatment efficacy while reducing side effects by delivering antioxidant or anti-inflammatory agents with precision. Stem Cell Therapy explores the regeneration of damaged oral mucosal tissues and immune modulation in OLP. Personalized Medicine customizes treatments based on individual genetics and factors. Immunomodulatory Therapies target autoimmune responses. Photodynamic Therapy (PDT) employs photosensitizers and specific light to safely destroy lesions, whereas Laser Therapy offers non-pharmacological alternatives. Quercetin, a natural therapeutic agent, was also considered. Cryotherapy with Nitrous Oxide Gas has emerged as a viable alternative with reduced side effects. Additionally, miRNA-based therapies and telemedicine for remote monitoring show promise, reflecting diverse approaches to advancing OLP treatment.

8 | Discussion, Limitations, and Future Directions

The overall decadal publication output on therapeutic strategies in OLP between 2014 and 2023 indicates substantial interest and research activity. There was a clear upward trend in the number of publications, with a peak in 2018. The substantial increase in publications during this time suggests that numerous studies, trials, and developments were taking place, driving the field forward. A slight decline in 2023 highlights the dynamic nature of research in this field. This decline may indicate that while the field continues to be active and vibrant, it might not be maintaining the same level of rapid growth as observed in previous years. This decline could be due to various factors, such as a temporary shift of research focus to other areas or a consolidation of existing knowledge. Similarly, another bibliometric study shows an upward trend in the publication output on OLP [150].

An analysis of the publication productivity of authors shows that the notable authors include Chaitanya Nallan CSK, Ameer Shaik, and Maryam Amirchaghmaghi, with varying levels of publication and citation impact. They have varying levels of

publication and citation impact, which implies that their work is influential and well-regarded within the academic community. Some authors had lower citation counts, indicating a need for increased visibility and recognition. These authors might have valuable contributions that are not yet widely acknowledged, suggesting a need for efforts to promote their research and increase its impact. The analysis of the publication productivity of institutions shows that Cairo University led in terms of publications and had a moderate citation count, indicating its strong influence. The analysis highlights temporal changes in terminology, specifically an increase in the number of terms used in various fields of science. This underscores the evolving nature of scientific research and the development of new concepts and terminologies over time. Similarly, OLP publication activity has expanded in the 21st century. The US is more prolific. China leads transitioning economies. India is a leading emerging market. LP research is global. Finland has the most publications per person. The number of generic scientific phrases used in any discipline of study has increased over time [151].

"Egyptian Dental Journal" from Egypt, "BMC Oral Health" from the UK, and "Journal of Dental Sciences" from Taiwan were among the top journals publishing articles on OLP therapeutic strategies. These journals have played a pivotal role in disseminating valuable insights and findings related to OLP treatment. These publications, however, exhibit diversity in terms of their impact factors and rankings within the academic community. Journals varied in terms of impact factors and rankings, with some in the top quartile (Q1) and others in lower quartiles. Highly cited articles covered a range of topics related to OLP treatment, including laser phototherapy, photodynamic therapy, and salivary biomarkers. These highly cited articles have likely made significant contributions to the development and understanding of therapeutic approaches for OLP. Maryam Amirchaghmaghi and Mohammad Taghi Shakeri were identified as highly productive authors. Collaboration patterns among authors and institutions revealed clusters and links, providing insights into research networks and partnerships. Their prolific output in terms of research articles and publications indicates their substantial involvement and expertize in the field of OLP therapeutic strategies. Additionally, an analysis of collaboration patterns among authors and institutions reveals the presence of clusters and links, providing valuable insights into the broader landscape of research networks and partnerships in the field. This information can shed light on the dynamics of knowledge exchange, interdisciplinary collaboration, and the establishment of research communities dedicated to advancing OLP treatment strategies. Similarly, since 2007, there has been a noticeable rise in the quantity of citations. Among the general OPMD, leukoplakia accounted for 42% and lichen planus for 23% of the individual illnesses [152].

There are different types of treatments for OLP that are meant to help people with this long-lasting, inflammatory mouth condition. Pharmacological treatments involve medications to alleviate symptoms and control the immune response. Non-pharmacological methods include lifestyle and dietary changes that can help minimize discomfort. Topical treatments directly target the affected oral mucosa, providing relief and reducing inflammation. Phototherapy employs controlled light exposure to manage OLP symptoms. Antioxidant therapy focuses on reducing oxidative stress, which plays a role in OLP pathogenesis. Standard treatments involve well-established medical interventions. Experimental options encompass cutting-edge therapies like Laser Phototherapy, Nanotechnology-Based Therapies, Stem Cell Therapy, and personalized medicine, tailoring treatments to individual patients. Immunomodulatory Therapies aim to regulate the immune response, while Photodynamic Therapy utilizes light and photosensitizing agents to treat OLP lesions. miRNA-based therapies explore the use of microRNAs to modulate gene expression and potentially mitigate OLP. These emerging strategies represent exciting avenues for future OLP management, offering hope for more effective and targeted treatment options. Similarly, results appeared in another bibliometric study of the top 100 publications in the Journal of Oral Pathology & Medicine [153].

8.1 | Discussion of Potential Limitations of the Bibliometric Study

While the above bibliometric study provides valuable insights into the research landscape surrounding therapeutic strategies for OLP, it is important to acknowledge the potential limitations that can affect the interpretation and generalizability of the findings.

This study relies on data from the Dimensions Database, which may not include all relevant publications in the field. Different databases may have varying coverage of journals and conferences, potentially leading to exclusion of important research. The study applied specific inclusion criteria, such as the minimum number of documents and citations for authors, institutions, and sources. These criteria can influence which data are included and potentially exclude emerging researchers, institutions, or sources that are still gaining recognition.

This study focuses on publications between 2014 and 2023, which may not capture earlier seminal works or recent developments in the field. OLP research may have a longer history, which is not accounted for in this timeframe. This study primarily uses citation counts as a measure of impact, which can be influenced by factors such as self-citations or citation practices within specific research communities. A high citation count does not necessarily indicate the quality or relevance of a publication. Keyword analysis is based on keyword co-occurrence patterns, which may not capture the nuanced relationships between topics or themes. This relies on the accuracy and consistency of keyword usage in publications.

Research on OLP is likely to evolve over time with new findings, treatments, and approaches. This study provides a snapshot of the field during a specific period, and the observed trends may change in the future. The study provides quantitative data but may lack the qualitative context necessary to fully understand the motivations, challenges, and implications of research in the field of OLP. The research topic spans multiple disciplines including dentistry, dermatology, immunology, and molecular biology. This study may not fully capture the interdisciplinary nature of this field.

In conclusion, while the above bibliometric study offers valuable insights into the research landscape of OLP therapeutic strategies, it is important to interpret the findings with caution considering the limitations inherent in bibliometric analyses. Researchers and policymakers should use these findings as a starting point for further investigation and consider complementary qualitative research to gain a deeper understanding of this field.

8.2 | Suggestions for Future Research Directions Based on the Findings

Based on the comprehensive bibliometric analysis presented in the provided information, there are several promising directions for future research in the field of OLP.

First, given the substantial increase in publications on OLP therapeutic strategies over the past decade, future research should focus on consolidating and synthesizing the existing knowledge through systematic reviews and meta-analyses. These reviews critically assess the effectiveness of various treatment modalities and provide evidence-based guidelines for clinicians and researchers. Additionally, conducting long-term follow-up studies to assess the durability of treatment outcomes and recurrence rates of OLP lesions is invaluable. Understanding the factors that contribute to recurrence and devising strategies for its prevention and management should be a priority.

Second, as emerging and innovative therapeutic strategies, such as Laser Phototherapy, Nanotechnology-Based Therapies, Stem Cell Therapy, and Personalized Medicine, are gaining attention, further research should delve into their mechanisms of action, safety profiles, and long-term effects. Comparative studies that evaluate the relative efficacy and cost-effectiveness of these innovative approaches compared with traditional treatments can help guide treatment decisions. Moreover, investigating the potential role of miRNA-based Therapies in OLP management and exploring the feasibility and effectiveness of telemedicine for remote monitoring and management of patients with OLP in the era of digital health can be a fruitful research avenue. Finally, understanding the psychosocial impact of OLP and developing interventions to address the psychological well-being of affected individuals should be explored. In essence, future research on OLP should not only advance our understanding of its pathophysiology and treatment but also prioritize patient-centered care and holistic well-being.

8.3 | Importance of further Investigations to Enhance the Understanding and Treatment of OLP

Further investigations are of paramount importance in enhancing the understanding and treatment of OLP. It is a chronic and potentially debilitating condition that affects the oral mucosa; however, its precise etiology and pathogenesis remain elusive. Comprehensive research can shed light on the underlying mechanisms, genetic predispositions, and potential triggers of OLP, providing crucial insights into disease prevention and early detection. Additionally, as the field witnesses a surge in the number of publications and evolving therapeutic strategies, ongoing investigations are essential to rigorously evaluate the safety and efficacy of these treatments, ensuring that patients receive the best possible care. Moreover, the diverse landscape of research collaboration and the identification of influential authors and institutions emphasize the need for continued interdisciplinary efforts in OLP research. By fostering collaboration and expanding our knowledge base, we can develop more targeted and personalized therapeutic approaches, ultimately improving the quality of life of individuals affected by OLP. In summary, further investigations not only advance our understanding of OLP, but also hold the potential to revolutionize its diagnosis and treatment, offering hope to those grappling with this chronic inflammatory condition.

9 | Conclusion

9.1 | Summary of the Key Findings From the Bibliometric Analysis

A bibliometric analysis of therapeutic strategies for OLP revealed several key findings. Between 2014 and 2023, a significant total of 40,046 publications were identified, reflecting a substantial and growing interest in OLP research. The trend chart shows a clear upward trajectory in publications, with a peak in 2022. Analysis of authors and institutions demonstrates variability in productivity and impact, with Chaitanya Nallan CSK and Cairo University leading their respective categories. Journals such as the “Journal of Dental Sciences” and “Indian Journal of Dental Research” have emerged as prominent sources in OLP research. The assessment of journal impact factors and citation rates highlights the varying degrees of influence within the field. Highly cited articles cover a wide range of topics, from treatment comparisons to biomarker investigations. Collaboration patterns between authors and institutions reveal interconnected networks within the academic community. Finally, emerging therapeutic strategies for OLP encompass innovative approaches such as Laser Phototherapy, Nanotechnology-Based Therapies, Stem Cell Therapy, and Personalized Medicine. These findings collectively offer a comprehensive overview of the evolving landscape of OLP research, emphasizing both the breadth and depth of investigation into its treatment and management.

9.2 | Implications for Clinical Practice and Research in Managing OLP

A comprehensive analysis of publications, authors, institutions, and treatment strategies related to OLP provides valuable insights with significant implications for clinical practice and research in managing chronic inflammatory conditions affecting the oral mucosa. The substantial increase in the number of publications over the past decade reflects the growing interest and research activity in OLP, underscoring the need for the ongoing exploration of therapeutic strategies. The identification of prominent authors and institutions, along with their varying levels of impact and collaboration, suggests opportunities for

knowledge sharing and interdisciplinary research collaboration to enhance the development of effective treatments. Additionally, the recognition of specific journals and their impact factors can guide clinicians and researchers to access high-quality research sources. The focus on highly cited articles and emerging therapeutic approaches such as laser phototherapy, nanotechnology-based therapies, and personalized medicine offers promising avenues for advancing OLP management. Moreover, emphasis on assessing treatment outcomes through clinical scores, resolution rates, and safety monitoring provides evidence-based guidelines for clinicians to make informed treatment decisions. Overall, these findings encourage a multidisciplinary approach to OLP research and emphasize the importance of staying abreast of emerging therapeutic strategies and research trends to improve clinical practice and patient outcomes in the management of OLP.

9.3 | The Importance of Continued Investigation and Collaboration in the Field of Therapeutic Strategies for OLP

The importance of continued investigation and collaboration in the field of therapeutic strategies for OLP cannot be overstated, as is evident from the comprehensive analysis presented in previous sections. With a significant increase in publications over the past decade and a diverse range of approaches and treatments being explored, ongoing research is vital to address the complex nature of OLP. Collaboration among researchers, institutions, and authors is essential for pooling resources, expertize, and data, ultimately accelerating the development of effective treatments. This collaboration not only facilitates the sharing of knowledge but also ensures that the most promising therapeutic options are thoroughly evaluated through rigorous quantitative assessments, clinical trials, and longitudinal studies. Moreover, continued investigation is crucial to uncover emerging and innovative therapeutic strategies that have the potential to revolutionize OLP treatment. Overall, sustained research and collaborative endeavors are essential to improve our understanding of OLP, enhance treatment outcomes, and ultimately improve the quality of life of individuals affected by this chronic inflammatory condition.

Author Contributions

Kumar Chandan Srivastava: conceptualization, methodology, data curation, formal analysis, writing–original draft, writing–review and editing, project administration, supervision, validation, visualization. **Ravinder S. Saini:** conceptualization, methodology, data curation; formal analysis, writing–original draft, writing–review and editing, resources, visualization, investigation, software. **Galvin Sim Siang Lin:** conceptualization, methodology, writing–review and editing. **Artak Heboyan:** data curation, formal analysis, writing–review and editing, visualization. **Deepti Shrivastava:** visualization, conceptualization, methodology, data curation, formal analysis, validation, writing–original draft; writing–review and editing, supervision, project administration.

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The authors have nothing to report.

Consent

The authors have nothing to report.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Transparency Statement

The lead author Kumar Chandan Srivastava, Artak Heboyan affirms that this manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned (and, if relevant, registered) have been explained.

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