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Who cites optometry journals?

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Abstract
Purpose: This work seeks to identify the most impactful journals, papers, authors, institutions, and countries that cite optometry journal articles.
Methods: The Scopus database was searched for papers citing at least one article published in any of the 18 optometry journals included in that database (i.e. 'optometry articles'). The 10 most highly cited papers that cite optometry journal articles were determined from 82,830 papers found. A h-index for "optometry journal citations" (the h_{OJC}-index) was derived for each entity in the categories of journals, papers, authors, institutions and countries to serve as a measure of impact.
Results: The h_{OJC}-index of the body of papers citing optometry journal articles is 370. Papers citing optometry journal articles have themselves been cited 2,054,816 times. *Investigative Ophthalmology & Visual Science* (h_{OJC} = 154) is the most impactful journal citing optometry articles and *Optometry and Vision Science* the most prolific (5310 papers). The most impactful paper citing optometry journal articles (5725 citations) was published in *Journal of Clinical Epidemiology*. Ophthalmologist Seang Mei Saw (h_{OJC} = 69) is the most impactful author and optometrist Nathan Efron is the most prolific (288 papers). Harvard University (h_{OJC} = 127) is the most impactful and UNSW Sydney is the most prolific institution (1761 papers). The United States is the most impactful and prolific nation (h_{OJC} = 313; 28,485 papers).
Conclusions: Optometry journal articles are cited extensively by optometrists, ophthalmologists, and vision scientists world-wide, as well as authors from a broad spectrum of non-ophthalmic research domains. This work confirms the utility and influence of optometry journals.

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Introduction

Optometry journals have been published for over a century[1]; these play an important role in providing an evidence-based rationale for the procedures, techniques and treatment paradigms adopted by clinical optometrists. As well, optometry journals serve as a vehicle for testing information generated by scientists and academics working in the field, disseminating important findings to the optometric research community and beyond, and constitute as a valuable written repository for the work that is undertaken.

Considerable human and physical resources, and significant associated fiscal expenditure, are required to sustain academic journals relating to a small discipline such as optometry, which perhaps raises the question of the value of these journals. The benefits of optometry journals to optometrists in clinical practice are difficult to measure objectively. Much of the evidence reported in optometry journals is eventually adopted by clinicians, whereby 'todays research becomes tomorrows practice' — a still-used theme first adopted in 2003 by the American Academy of Optometry.[2] One difficulty that complicates the measurement of clinical impact of research is the time lag of knowledge translation from publication to clinical utilisation, which has been estimated to be around 17 years.[3—5]

From the perspective of optometric research, the question of value can be addressed by exploring the degree to which the information published in optometry journals is used, where it is used, and the impact of that usage. Examination of journal citations can assist in this regard. All scientific work relies on, and builds upon, previously published literature; invariably, scientific authors cite this literature at the end of papers they write. Modern bibliographic tools are available to search and analyse these citations, thus providing a means of assessing the extent to which specific research papers are valued, as well as the overall impact of a body of literature.[6]

Taking this a step further, the impact of entities such as journals, authors, institutions, or countries citing a defined body of literature can be evaluated by calculating the h-index[7] — a single metric that combines productivity (number of papers) and quality (number of citations). The h-index of an entity is defined as the maximum value of h, whereby an entity has published h papers that have each been cited at least h times.[3]

The aim of this paper is to determine the extent to which articles published in optometry journals (referred to throughout this paper as 'optometry articles') are cited as a whole, and then to drill down to determine the most impactful papers and authors citing optometry articles, as well as the most impactful journals, institutions, and countries that cite the optometry journal literature. This will provide a quantitative assessment of the impact of optometry journals.

Materials and methods

Search protocol

A preliminary search was undertaken to find all optometry journals in the Scopus database (Elsevier). 'Optometric journals' were defined as journals with 'optometry', 'optometric' or 'optometrist' in the title, as well as journals that do not have the stem 'optom' in the title, but are principally organized by the optometric profession or a primarily optometric organization. Eighteen optometry journals were found; these are listed in Table 1, ranked in order of impact factor for year 2021 (Clarivate [8]), then the total number of papers for that journal on the Scopus database.

A search term was derived to interrogate the Scopus database and find all articles published between January 1, 1970, and September 25, 2022, that cited at least one paper from any of the 18 optometry journals listed on that database (spanning from 1920 to the present time; see Table 1). This search term used journal International Standard Serial Numbers (ISSN) or source titles. The search criteria were refined through several iterations, resulting in the following equation being derived:

> (ref ISSN (1040-5488) OR ref ISSN (0275-5408) OR ref ISSN (0816-4622) OR ref ISSN (0003-0244) OR ref ISSN (0817-881x) OR ref ISSN (1888-4296) OR ref ISSN (1705-4850) OR ref ISSN (1050-6918) OR ref ISSN (1529-1839) OR ref ISSN (0141-7037) OR ref ISSN (1444-0938) OR ref ISSN (0093-7002) OR ref ISSN (13670484) OR ref ISSN (0007-1218)) OR REFSRCTITLE (optomet*) OR REFSRCTITLE (hindsight AND saint AND louis AND mo) OR REFSRCTITLE (international AND contact AND lens AND clinic) AND (EXCLUDE (SRCTYPE, "b") OR EXCLUDE (SRCTYPE, "Undefined")) AND (EXCLUDE (DOCTYPE, "ch") OR EXCLUDE (DOCTYPE, "bk")) AND (LIMIT-TO (LANGUAGE, "English"))

Supplementary information included in this paper, such as the year range of publication of journals, professional and production publishers of journals, professional background of authors and organisational arrangements of institutions in respect of optometry schools, was determined by searching the internet for websites of the journals, authors and institutions of interest.

Assessing impact

A h-index for "optometry journal citations" (the "h_{OJC}-index") was derived, to serve as a measure of the impact of the search result across journals, authors, institutions, and countries. This technique has been used extensively by the current authors.[9—12] In brief, the h_{OJC}-index of a given entity was determined by sorting the subset of optometry articles for that entity by rank order of citations to those articles (from highest to lowest) and working down the list, starting with the article that had the highest number of citations, to determine the article with a rank number that was larger than its number of citations. Taking the example of 'authors', the h_{OJC}-index for that author was identified as the number of the entry above the identified article. This was repeated for each of the 100 most prolific authors of optometry articles; the top 20 were then identified and ranked in order of h_{OJC}-index. The same approach was applied to identify the most impactful journals, institutions and countries that cite optometry articles.

Results

The search revealed that 82,830 papers have referenced optometry articles; these papers have in turn been cited a total of 2,054,816 times. The combined h_{OJC}-index of this

Table 1 Optometric journals found in the Scopus database, ranked by impact factor then number of papers.

Rank	Journal	Year range [a]	Professional publisher	Production publisher	Impact factor [b]	# of papers
1	Ophthalmic and Physiological Optics [c]	1950—2022	College of Optometrists	Wiley	3.992	3769
2	Contact Lens & Anterior Eye [d]	1978—2022	British Contact Lens Association	Elsevier	3.946	2615
3	Clinical and Experimental Optometry [e]	1920—2022	Optometry Australia	Taylor & Francis	3.143	7742
4	Optometry and Vision Science [f]	1924—2022	American Academy of Optometry	Lippincott Williams & Wilkins	2.106	13,095
5	Optometry [g]	1949—2012	American Optometric Association	American Optometric Association	0.833	5039
6	Journal of Optometry	2008—2022	Spanish General Council of Optometry	Elsevier	NR	538
7	Clinical and Refractive Optometry	2003—2016	None	VuePoint IDS Inc.	NR	421
8	Optometric Weekly	1945—1964	None	Professional Press	NR	323
9	Optical Journal and Review of Optometry	1946—1951	None	Optical Publishing Company	NR	222
10	Advances in Ophthalmology and Optometry	2016—2022	None	Elsevier	NR	178
11	Optometry Clinics	1991—1996	Prentice Society	Appleton and Lange	NR	178
12	Clinical Optometry	2014—2022	None	Dove Medical Press	NR	170
13	Practical Optometry	1999—2003	None	Mediaconcept, Inc.	NR	159
14	Hindsight	1997—2016	Optometric Historical Society	American Optometric Association	NR	79
15	Archives of the Americana Society of Ophthalmology & Optometry	1972—1984	Americana Society of Ophthalmology & Optometry	Americana Society of Ophthalmology & Optometry	NR	27
16	Columbia Optometrist	1945—1948	Columbia Optometry Student Association	Columbia Optometry Student Association	NR	7
17	Florida Optometrist	1947—1947	Florida Optometric Association	Florida Optometric Association	NR	2
18	Southern Journal of Optometry	1962—1962	Southern Council of Optometrists	Southern Council of Optometrists	NR	1
				Total		34,565

NR = not ranked.
[a] Range of years of papers for each included in the Scopus database, which in many instances is less than the full year range for the journal.
[b] Calculated for year 2021, except for the journal 'Optometry', which is calculated for year 2012 (final year of publication).
[c] Includes British Journal of Physiological Optics.
[d] Includes Journal of the British Contact Lens Association; International Contact Lens Clinic.
[e] Includes Australasian Journal of Optometry; Australian Journal of Optometry.
[f] Includes Northwest Journal of Optometry; American Journal of Optometry and Physiological Optics; American Journal of Optometry and Archives of American Academy of Optometry.
[g] Includes Journal of the American Optometric Association.

body of work is 370. A total of 13.9% of papers referencing optometry articles have received no citations.

The time course of publication of the papers referencing optometry articles from 1970 to September 25, 2022 — is shown in Fig. 1. It is evident from this graph is that there has been a steady increase in the output of papers referencing optometry articles to over 6000 papers per year at the present time.

Most impactful journals citing optometry articles

The top 20 journals in the Scopus database which cite optometry articles are listed in Table 2 in rank order of h_{OJC}-indices, which range from 37 to 154. These top 20 journals can be categorised as: ophthalmology — 11; optometry — 4; vision science — 3; and general science — 2.

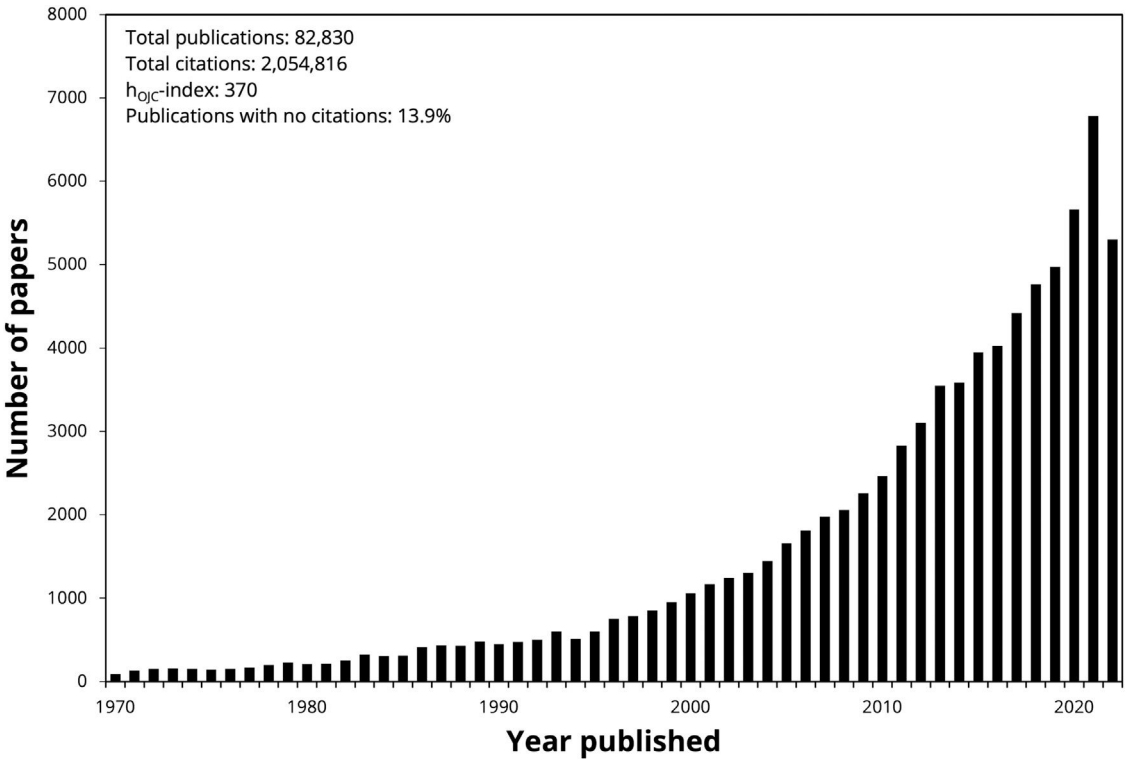

Fig. 1 Number of papers citing optometry articles each year between 1970 and 2022.

The six highest ranking journals in Table 2 are published in the United States. The three highest ranked journals are not optometric; these are *Investigative Ophthalmology & Visual Science* (h_{OJC} = 154), *Ophthalmology* (h_{OJC} = 133) and *Vision Research* (h_{OJC} = 127). The highest performing optometric journal, at rank #4, is *Optometry and Vision Science* (h_{OJC} = 113), with the other four optometry journals ranking #10, #14 and #16.

The journals that have published the highest number of papers citing optometry articles are: *Optometry and Vision Science* – 5310 papers; *Investigative Ophthalmology & Visual Science* – 3139; *Ophthalmic and Physiological Optics* – 2170; and *Clinical and Experimental Optometry* – 2080.

Most impactful papers citing optometry articles

The top 10 most impactful papers citing optometry articles are shown in Table 3. These papers have been cited between 2223 and 5725 times. The most highly cited paper referencing optometry articles (5725 citations) is by Terwee et al., entitled 'Quality criteria were proposed for measurement properties of health status questionnaires', and published in *Journal of Clinical Epidemiology*. Only one of the 52 references in this paper was to an article in an optometric journal – *Ophthalmic and Physiological Optics*.

One of the 10 most impactful papers citing optometry articles presented in Table 3 was published in a vision science journal (*The Ocular Surface*), one appeared in an ophthalmology journal (*Survey of Ophthalmology*), and the rest appeared in a diverse array of journals, from the fields of epidemiology, psychology, oncology, allergy, neurology, neurophysiology, and general medicine.

Most impactful authors of papers citing optometry articles

The 20 most impactful authors of papers citing optometry articles are presented in Table 4 and have h_{OJC}-indices ranging from 43 to 69. The academic qualifications of these top 20 authors are: optometrist – 12; ophthalmologist – 4; optical physicist – 2; biostatistician – 1; and microbiologist – 1.

The most impactful author of papers citing optometry articles is ophthalmologist Seang Mei Saw (h_{OJC} = 69). None of the top 4 authors are optometrists; the highest-ranking optometrists are Karla Zadnik (rank #5; h_{OJC} = 53) followed by Lyndon Jones (rank #6, h_{OJC} = 51).

The two most prolific authors of papers citing optometry articles in the top 20 are optometrists Nathan Efron (*n* = 288 papers) and Lyndon Jones (*n* = 282). Microbiologist Mark Willcox (*n* = 256) is at rank #3. The top 20 authors who have published the highest percentage of papers citing optometry articles as a function of their total paper output are optometrists Jason Nichols (80%), Lyndon Jones (79%) and Michael Collins (73%).

Five (25%) of the top 20 most impactful authors of papers citing optometry articles are female: ophthalmologist Seang Mei Saw (h_{OJC} = 69), optometrists Karla Zadnik (h_{OJC} = 53) and Fiona Stapleton (h_{OJC} = 45), biostatistician Gladys Mitchell (h_{OJC} = 45) and optical physicist Susanna Marcos (h_{OJC} = 44).

Most impactful institutions producing papers that cite optometry articles

The top 20 institutions producing papers that cite optometry articles are listed in Table 5. The h_{OJC}-indices of these institutions range from 71 to 127. The top-ranking institution is

Table 2 Most impactful journals referencing optometry articles, ranked by journal h_{OJC}, then number of papers.

Rank	Journal	h_{OJC}-index	# of papers	Impact factor
1	Investigative Ophthalmology & Visual Science	154	3139	4.925
2	Ophthalmology	133	1064	14.277
3	Vision Research	127	1798	1.984
4	Optometry and Vision Science [a]	113	5310	2.106
5	JAMA Ophthalmology [b]	110	808	8.253
6	American Journal of Ophthalmology	99	1129	5.488
7	Journal of Cataract and Refractive Surgery	96	1191	3.528
8	British Journal of Ophthalmology	89	968	5.908
9	Cornea	83	972	3.152
10	Ophthalmic and Physiological Optics [c]	81	2170	3.992
11	Experimental Eye Research	81	730	3.770
12	Journal of Refractive Surgery	68	673	3.255
13	PLoS One	64	1255	3.752
14	Clinical and Experimental Optometry [d]	59	2080	3.143
15	Acta Ophthalmologica	56	832	3.988
16	Contact Lens & Anterior Eye [e]	55	1656	3.946
17	Eye and Contact Lens [f]	54	1014	3.152
18	Graefe's Archive for Clinical and Experimental Ophthalmology	53	866	3.535
19	Clinical Ophthalmology	44	755	0.74
20	Scientific Reports	37	805	4.996

[a] Includes American Journal of Optometry and Physiological Optics, American Journal of Optometry and Archives of American Academy of Optometry, Optometry and Vision Science Official Publication of the American Academy of Optometry, and America Journal of Optometry and Archives of American Academy of Optometry.
[b] Includes Archives of Ophthalmology.
[c] Includes British Journal of Physiological Optics and Ophthalmic Physiological Optics — The Journal of the British College of Ophthalmic Opticians Optometrists.
[d] Includes Australasian Journal of Optometry, Australian Journal of Optometry, Clinical Experimental Optometry Journal of the Australian Optometrical Association, Clinical Experimental Optometry.
[e] Includes Journal of the British Contact Lens Association and International Contact Lens Clinics.
[f] Includes Contact Lens Association of Ophthalmologists Journal.

Harvard University, United States (h_{OJC} = 127), followed by Johns Hopkins University, United States (h_{OJC} = 111) and Moorfields Eye Hospital, United Kingdom (h_{OJC} = 104). Thirteen of the top 20 institutions are home to optometry schools; of these, Ohio State University has the highest ranking (#5) (h_{OJC} = 98). It should be noted that many of these institutions with optometry schools house ophthalmology academic units, which also contribute to these metrics.

UNSW Sydney, Australia, has produced the highest number of papers citing optometry articles (n = 1761), with the University of Melbourne, Australia ranked #2 (n = 1650).

The number of institutions from the various countries represented in Table 5 are: United States — 11; Australia — 5; United Kingdom — 2; Singapore — 1; and Canada — 1.

Most impactful countries producing papers that cite optometry articles

The 20 most impactful countries producing papers that cite optometry articles are listed in Table 6. The h_{OJC}-indices of the countries listed range from 21 to 313, and the paper count from 1142 to 28,485. The United States is the most impactful and prolific nation producing papers that cite optometry journals (h_{OJC} = 313; n = 28,485) — having a substantially greater h_{OJC}-index, and producing almost three times as many papers, as #2 ranked United Kingdom (h_{OJC} = 200; n = 9788).

Discussion

The use of citation metrics to assess research impact does not have universal acceptance. The underlying assumption is that there is a direct association between the number of citations and the quality of the work, a view which is strongly supported by some bibliometric researchers,[13] although disputed by others.[14] Notwithstanding this difference of opinion, citation analysis is generally considered to be a useful objective tool for evaluating the impact of scholarly articles, and by extension, the impact of the authors, journals, institutions and countries generating these works.

The increase in the number of papers citing optometry journals over the past half-century, as depicted in Fig. 1, and the substantial impact of this body of work as described above, is evidence of the growing value of optometry journals — not just to optometry, but the broader scientific fraternity that relies upon optometric research to support its own scientific advancements.

Most impactful journals citing optometry articles

It is not surprising that 15 of the top 20 journals (75%) are ophthalmic (i.e., 11 ophthalmology and 4 optometry journals). In any field of research, authors tend to cite papers that in some way support the work that is being reported,

Table 3 Most impactful papers referencing optometry articles, ranked by number of citations.

Rank	Title	First Author	Journal	Year, volume; pages	Citations
1	Quality criteria were proposed for measurement properties of health status questionnaires	Caroline Terwee	Journal of Clinical Epidemiology	2007, 60; 34—42	5725
2	The International Classification of Headache Disorders, 3rd edition	Jes Olesen	Cephalalgia	2013, 33; 629—808	5603
3	Eye movements in reading and information processing: 20 years of research	Keith Rayney	Psychological Bulletin	1998, 124; 372—422	4920
4	Photodynamic therapy for cancer	Dennis Dolmans	Nature Reviews Cancer	3; 380—7	4868
5	Biofilms: Survival mechanisms of clinically relevant microorganisms	Rodney Donlan	Clinical Microbiology Reviews	2002, 15; 167—93	4552
6	Allergic rhinitis and its impact on asthma (ARIA) 2008 update	Jean Bousquet	Allergy: European Journal of Allergy and Clinical Immunology	2008, 63; 8—160	3574
7	Safety, ethical considerations, and application guidelines for the use of transcranial magnetic stimulation in clinical practice and research	Simone Rossi	Clinical Neurophysiology	2009, 120; 2008—39	3475
8	Risk factors for hip fracture in white women	Steven Cummings	New England Journal of Medicine	1995, 332; 767—74	3157
9	The definition and classification of dry eye disease: Report of the definition and classification subcommittee of the international dry eye workshop	Michael Lemp	The Ocular Surface	2007, 5; 75—92	2325
10	Keratoconus	Yaron Rabinowitz	Survey of Ophthalmology	1998, 42; 297—319	2223

which therefore would be primarily derived from the literature base underpinning that field. The authors found 202 non-disambiguated ophthalmology journal names on the Scopus database, compared to 18 disambiguated optometry journal names. Therefore, given the substantial overlap in the subject matter reported by optometry and ophthalmology journals, it is not unexpected that almost three times as many ophthalmology journals cite optometry articles than optometry journals. These citation statistics demonstrate that optometry journals do not exist for the exclusive advancement of optometric science and the optometric profession; optometry journals are also used extensively and valued by ophthalmology researchers, in addition to vision scientists and general medical researchers.

A total of 5310 papers in *Optometry and Vision Science* have cited optometry articles, which is considerably greater than second-ranked *Investigative Ophthalmology & Visual Science* (3139 papers). However, optometry article-citing papers published by *Optometry and Vision Science* (h_{OJC} = 113) are less impactful than those published by *Investigative Ophthalmology & Visual Science* (h_{OJC} = 154). The likely reason for this is that a substantial proportion of the papers published in *Optometry and Vision Science*, especially during the first 40 years of publications of that journal (say, 1924 to the 1960s), were editorials, professional commentaries, and clinical material such as case reports — material that tends not to be cited extensively. Conversely, *Investigative Ophthalmology & Visual Science* was established more recently (1962) as a 'science only' journal, and as such has generally publishes work that is more likely to be cited. The readership of *Investigative Ophthalmology & Visual Science* is also presumably much larger than that of *Optometry and Vision Science*.

Most impactful papers citing optometry journals

The broad spectrum of fields reflected amongst the most highly cited papers displayed in Table 3 reinforces the notion that the optometry literature has value far beyond the ophthalmic domain. The 10 leading papers that cite optometry articles are themselves highly impactful, having been cited between 2000 and 6000 times. The impact of such publications can be appreciated when considering that only 0.03% of scientific papers have been cited more than 1000 times.[15]

Table 4 Most impactful authors referencing optometry articles, ranked by journal h_{OJC}, then number of papers.

Rank	Author	h_{OJC}-index	# of Papers citing optometry articles	h-index	Total papers	% Total papers citing optometry articles
1	Seang Mei Saw [a]	69	198	94	600	33.0%
2	Tienyin Wong [a]	60	191	155	1759	10.9%
3	Mark Willcox [a]	54	256	67	540	47.4%
4	Paul Mitchell [a]	54	141	137	1136	12.4%
5	Karla Zadnik	53	136	59	221	61.5%
6	Lyndon Jones	51	282	54	359	78.6%
7	Kazuo Tsubota [a]	51	266	98	1360	19.6%
8	Konrad Pesudovs	50	182	75	320	56.9%
9	Nathan Efron	48	288	62	442	65.2%
10	Michael Collins	46	196	49	270	72.6%
11	David Atchison	45	225	46	313	71.9%
12	Fiona Stapleton	45	205	52	313	65.5%
13	Gladys Mitchell [a]	45	93	49	135	68.9%
14	Neil Charman [a]	44	184	50	262	70.2%
15	Susanna Marcos [a]	44	152	52	239	63.6%
16	Donald Mutti	44	112	52	170	65.9%
17	Earl Smith	44	107	58	227	47.1%
18	James Wolffsohn	43	219	49	304	72.0%
19	Brien Holden	43	157	57	346	45.4%
20	Jason Nichols	43	145	49	182	79.7%

[a] Not an optometrist.

Table 5 Most impactful institutions referencing optometry articles, ranked by journal h_{OJC}.

Rank	Institution	Country	h_{OJC}-index	# of papers
1	Harvard University [a]	United States	127	1556
2	Johns Hopkins University [b]	United States	111	1141
3	Moorfields Eye Hospital [c]	United Kingdom	104	1494
4	National University of Singapore [d]	Singapore	100	990
5	Ohio State University	United States	98	1035
6	University of California, Berkeley	United States	96	1343
7	University of Alabama at Birmingham	United States	95	901
8	University of Melbourne [e]	Australia	94	1650
9	UNSW Sydney	Australia	93	1761
10	University of Houston	United States	90	1106
11	National Institutes of Health [f]	United States	89	384
12	Queensland University of Technology	Australia	87	1288
13	University of Sydney	Australia	81	728
14	University of Waterloo	Canada	80	1324
15	University of Miami [g]	United States	77	686
16	University of California Los Angeles [h]	United States	76	691
17	Brien Holden Vision Institute [i]	Australia	75	665
18	University of Manchester	United Kingdom	73	759
19	University of Southern California	United States	72	420
20	Indiana University	United States	71	590

[a] Includes Schepens Eye Research Institute; Mass Eye and Ear.
[b] Includes Wilmer Eye Hospital.
[c] Includes University College, London; Institute of Ophthalmology.
[d] Includes Singapore National Eye Centre; Singapore Eye Research Institute.
[e] Includes Royal Victorian Eye and Ear Hospital.
[f] Includes National Eye Institute.
[g] Includes Bascom Palmer Eye Institute.
[h] Includes David Geffen School of Medicine; Jules Stein Eye Institute.
[i] Includes Vision Cooperative Research Centre.

Table 6 Most impactful countries referencing optometry articles, ranked by journal h_{OJC}.

Rank	Country	h_{OJC}-index	# of papers
1	United States	313	28,485
2	United Kingdom	200	9788
3	Australia	162	7297
4	Germany	144	4041
5	Canada	143	4342
6	Japan	117	3120
7	Spain	116	3877
8	China	114	6397
9	Netherlands	112	1883
10	Singapore	107	1286
11	Italy	106	2763
12	France	104	1864
13	Switzerland	89	1212
14	Hong Kong	81	1191
15	India	79	2919
16	South Korea	71	1835
17	Brazil	64	1249
18	Turkey	57	2063
19	Iran	56	1396
20	Taiwan	21	1142

Although 82,830 papers are known to have cited optometry articles, only 13.9% of these papers have never been cited themselves, attesting to the overall quality and impact of papers citing optometry articles. The balance of these papers has been cited over 2 million times, further demonstrating the importance of those works, and by extension their value in developing ideas or verifying factual information relating to vision science and beyond.

Most impactful authors of papers citing optometry articles

The most impactful author of publications citing optometry articles is Seang Mei Saw (h_{OJC} = 69), who is professor of ophthalmology at the National University of Singapore. She holds a joint appointment at the Saw Swee Hock School of Public Health, and in that position has conducted several large-scale epidemiologic studies on myopia in children, as principal investigator. Given that the field of refractive error has always been a core area of *optometric* research and clinical practice,[11] Professor Saw would have found it necessary to cite optometry articles extensively to support her writings. As an ophthalmologist, much of her work would be published in ophthalmology journals, which are known to generally have higher impact than optometry journals, hence the high impact of the papers authored by Professor Saw which cite optometry articles. For similar reasons, ophthalmologists Tienyin Wong (h_{OJC} = 60) and Paul Mitchell (h_{OJC} = 54) are ranked #2 and #4.

The last column in Table 4 shows, for each author, the proportion of papers citing optometry articles as a function of all papers published by that author. For the four ophthalmologists listed in this table (Seang Mei Saw, Tienyin Wong, Paul Mitchell and Kazuo Tsubota), none of whom work in university optometry departments, this proportion ranges from 12.4% to 33.0%. For the other 16 authors in Table 4, all of whom work in university optometry departments, the proportion ranges from 45.4% to 79.7%. This observation supports the notion that authors working in a given field are more likely to cite articles from journals relating to that field.

The countries where the top 20 authors have spent most or all of their academic careers are: Australia — 8; USA — 7; UK — 2; Canada — 1; Japan — 1; and Singapore — 1.

Most impactful institutions and countries producing papers that cite optometry articles

The four highest ranking institutions listed in Table 5 are the home of world-renowned ophthalmology departments, hospitals, or eye institutes. Much of the research generated by these institutions, which cites optometry articles, is typically published in high impact ophthalmology journals.

The United States is the leading country for life sciences research,[16] which is consistent with this nation producing papers of the highest impact, and the greatest volume of papers, that cite optometry articles.

Comparison with other disciplines

The volume of the body of papers citing optometry articles (82,830) and the associated measure of impact of these papers (h_{OJC} = 370) can be compared with other disciplines by undertaking crude searches in Scopus. Articles published in dentistry journals been cited by a similar number of papers (80,101) to that of optometry; however, papers citing dentistry articles are less impactful (h_{OJC} = 316) than those of optometry. The body of papers citing articles published in veterinary medicine journals is less extensive (42,208 papers) and less impactful (h_{OJC} = 187) than that for optometry. The higher impact of papers citing optometry articles compared with papers citing dentistry or veterinary medicine articles is not related to the relative size of these professions; for example, there are approximately 165,000 dentists, 120,000 veterinarians and 40,000 optometrists in the United States. Given that citation metrics generally correlate with the size and reach of a discipline,[17] the above comparisons could suggest that optometry journals that underpin the practice of optometry are disproportionately more valuable than those supporting dentistry or veterinary science.

Conclusions

Optometry journals are cited extensively by optometrists, ophthalmologists, and vision scientists world-wide, as well as authors from a broad spectrum of non-ophthalmic research domains. That around 6000 scientific papers citing optometry articles are published annually is an indication of the intrinsic value of the information generated by optometry journals, in a sense providing a *raison d'être* for the very existence of optometry journals and a justification for the ongoing support to publish such journals by optometric professional organisations.

Conflicts of interest

The authors of this work are identified as leading authors citing optometry articles, from which they stand to derive reputational benefit. The authors also declare the following:

Nathan Efron: Over the past three years: Lecture honoraria from CooperVision and Johnson & Johnson Vision Care; consulting fees from Procter & Gamble.

Lyndon Jones: Over the past 3 years Dr Jones' research group (CORE) or he personally has received research support or lectureship honoraria from: Alcon, Allergan, CooperVision, GL Chemtec, iMed Pharma, J&J Vision, Lubris, Menicon, Nature's Way, Novartis, Ote, PS Therapy, Safilens, Santen, Shire, SightGlass and Visioneering. Dr Jones is also a consultant and/or serves on an advisory board for Alcon, CooperVision, J&J Vision, Novartis and Ophtecs.

Jason Nichols: Over the last 3 years, Dr. Jason J. Nichols has received honoraria from Paragon Vision Sciences and CooperVision. He has also received research funding from Alcon, Bruder, Johnson and Johnson Vision, and Mallinckrodt. Also, Dr. Kelly Nichols is the spouse of Dr. Jason Nichols, extending her declarations to him. In the past 12 months, Dr. Kelly Nichols has consulted for and received honorarium from: Bruder, Dompe, Kala, Novartis/Shire (Medical Exchange International), Osmotica, Oyster Point, Sight Sciences, Tear Film Innovations/Alcon/Acquiom, Thea, Tarsus, and TopiVert. She has received research funding from: Allergan, Kala, and Tear Science.

Phillip Morgan: Dr Morgan or his research group, over the past three years, have received research funding and/or honoraria from: Alcon, AMCo, CooperVision, Essilor, Johnson & Johnson Vision, Menicon, RB, Shire and Ultravision.

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