# Citation Characteristics of Research Articles under the Center of Cleft Lip - Cleft Palate and Craniofacial Deformities, Khon Kaen University

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Center of Cleft Lip - Cleft Palate and Craniofacial Deformities, Khon Kaen University, has cooperated with the Medical Association of Thailand in publishing the special five issues of JMAT (Journal of the Medical Association of Thailand) during the years 2010-2014 in order to promote research activities and working network of related fields in cleft lip - cleft palate and craniofacial deformities. This study aimed to examine the features of 106 research articles in terms of authors and disciplines, and analyze the citations considering sources, country and years after publication. The scope of study also included citations in the form of journal, which was presented as journal ranking compared with impact factors and Bradford's Law on journal citation. The results of study will be useful in developing multidisciplinary research activities of the center, and especially assist in the acquisition of academic journals for essential sources of reference.

Keywords: Citation pattern, Citation analysis, Research article, Center of Cleft Lip - Cleft Palate and Craniofacial Deformities

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Center of Cleft Lip - Cleft Palate and Craniofacial Deformities, Khon Kaen University, was established as a specialized research center in January 2007, in succession to "caring center of patients with cleft lip - cleft palate and craniofacial deformities under the Tawanchai Royal Granted Project"(1). The center's major task is promoting research activities in order to contribute new knowledge in its field as well as encouraging publication. In the year 2010, the cooperation with the Medical Association of Thailand was initiated in publishing the first journal issue on the special subject of cleft lip - cleft palate and craniofacial deformities. Until the year 2014 there have been five special issues of JMAT which have brought the research articles of the center out to public. The nature of working and publishing of the center involve multidisciplinary from many experienced related fields. This leads to examining those published research articles during the past five years in order to

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Phone: +66-43-363257 E-mail: chaiwitt@gmail.com demonstrate the attributes and citation patterns of the articles, in which these would be benefit in developing research activities to reach the center's functional goals.

#### **Objective**

1) To examine the research articles under the Center of Cleft Lip - Cleft Palate and Craniofacial Deformities which were published in the special issues of JMAT during the years 2010-2014, concerning the authors and multidisciplinary fields.

2) To examine the citation characteristics of those research articles of the center, concerning sources, reference citation's country, reference citation's years after publication, and cited journal ranking.

#### **Material and Method**

This documentary research was performed by compiling research articles under the Center of Cleft Lip - Cleft Palate and Craniofacial Deformities from the five special issues of JMAT during the years 2010 to 2014 which were volume 93, supplement 4, October 2010; volume 94, supplement 6, December 2011; volume 95, supplement 11, November 2012; volume 96, supplement 4, September 2013; and volume 97,

Table 1. Number of article, author, and citation

Year	Article		Author	Citation	Author per article	Citation per article
	Total	Single-author			per article	per article
2010	14	0	54	229	3.86	16.36
2011	21	2	85	385	4.05	18.33
2012	30	2	123	530	4.10	17.67
2013	24	0	91	615	3.79	25.63
2014	17	0	79	371	4.65	21.82
Total	106	4	432	2,130	4.08	20.09

supplement 10, October 2014. Data extraction included first authors, co-authors, and number of citations. The citation characteristics cover sources (such as journal, book, internet), reference citation's country (Thai or foreign), and reference citation's years after publication (1-5, 6-10, or more than 10 years). The recorded data was classified and analyzed by Excel and SPSS programs to demonstrate the citation characteristics including trends and journal citations. The journal citation ranking was compared with the impact factors and Bradford's Law of Scattering<sup>(2)</sup>.

#### Results

# Number of research articles, authors, and citations

During the past five years, 2010 to 2014, the number of research articles under the Center of Cleft Lip - Cleft Palate and Craniofacial Deformities published in JMAT ranged from 14 to 30 per year, accounting for a total of 106 articles and written by a total of 432 authors. There were only four single-authored articles and the total number of citations was 2,130. The mean of author per article was 4.08 and citation per article was 20.09 (Table 1).

# First author and interdisciplinary/multidisciplinary articles

During the years 2010 to 2014, there were 69.05% of the articles where the first author was affiliated with Faculty of Medicine, Khon Kaen University and 70.67% of the articles were conducted by interdisciplinary or multidisciplinary research team (Table 2).

# Interdisciplinary/multidisciplinary articles in regard to the authors

In regard to the first author's field of expertise (Table 3), the top five most common were nursing, otorhinolaryngology, dentistry (orthodontics), plastic

 Table 2. First author at KKU Faculty of Medicine and multidisciplinary article

Year	# of article	First author (%)	Multidisciplinary article (%)
2010	14	78.57	85.71
2011	21	66.67	61.90
2012	30	66.67	80.00
2013	24	66.67	37.50
2014	17	66.67	88.23
Total	106	69.05	70.67

surgery, dentistry (oral diagnosis), respectively. There were eight fields of the first author who wrote only one article each, such as Behavioral Science, Business Administration, and Community Development. In regard to the co-authors' field, the top ten were plastic surgery, nursing, radiology, otorhinolaryngology, anatomy, dentistry (orthodontics), urology surgery, neurosurgery, psychiatry, rehabilitation, respectively. There were sixteen subject fields with only one co-author such as dermatology, medical illustration, social welfare, etc.

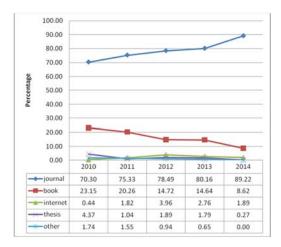
# Citations classified by sources, country areas, and years after publication

Considering the source of references, during the years 2010 to 2014 the citations in the articles were mostly journals, including both print and online versions, ranging from 70.30% to 89.22% whereas the citations of books, including both print and online version, decreased from 23.15% to 8.62%. The citations from the internet, excluded online journal/book/thesis, ranged from 0.44% to 3.96% and citations of other forms, such as conference proceedings, poster presentation, newsletter, ranged from 0.00% to 1.74% (Fig. 1).

Citations used in the articles were originated

Table 3. Ranking of academic field of first author and co-author

Rank	First author	Frequency	Rank	Co-author	Frequency
1	Nursing	21	1	Plastic surgery	33
2	Otorhinolaryngology	18	2	Nursing	16
3	Dentistry (orthodontics)	13	3	Radiology	7
4	Plastic surgery	11	4	Otorhinolaryngology	5
5	Dentistry (oral diagnosis)	8	5	Anatomy	4
6	General surgery	6		Dentistry (orthodontics)	4
7	Neurosurgery	4		Urology surgery	4
	Pediatrics	4	6	Neurosurgery	3
	Psychiatry	4		Psychiatry	3
8	Community medicine	3		Rehabilitation	3
9	Cardiovascular & thoracic surgery	2	7	Pathology	2
	Ophthalmology	2		Pediatrics	2
	Urology surgery	2		Pharmacy	2
10	Behavioral science	1		Physiology	2
	Business administration	1	8	Anesthesiology	1
	Community development	1		Biochemistry	1
	Dentistry (community)	1		Community medicine	1
	Dentistry (oral biology)	1		Dentistry (community)	1
	Library science	1		Dentistry (family & community)	1
	Medical records & statistics	1		Dentistry (oral & maxillofacial surgery)	1
	Obstetrics & gynecology	1		Dentistry (oral diagnosis)	1
				Dentistry (restorative)	1
				Dermatology	1
				General surgery	1
				Internal medicine	1
				Medical illustration	1
				Medical records & statistics	1
				Medicine (cardiology)	1
				Obstetrics & gynecology	1
				Social welfare	1



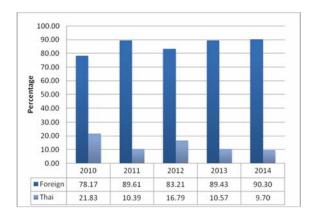
"internet" refers to any information from the internet, except for online journal, book, thesis and other (such as proceedings)

Fig. 1 Percentage of citation classified by source type.

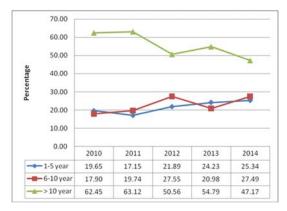
from two areas, i.e. Thailand and foreign countries. Citations were from Thailand and foreign countries ranging from 9.70% to 21.83% and 78.17% to 90.30%, respectively (Fig. 2). The citations used in the articles aged mostly >10 years of their first launch, ranging from 47.17% to 63.12%, whereas citations aged 1-5 years after their first launch were counted for 17.15% to 25.34% (Fig. 3).

## Journal source citation with ranking

All 106 research articles in the past five years cited 479 journals with the total of 1,667 citations. Table 4 shows the top 73 journals, which the citations were performed accounting for 67.08% or more than half of all the citations from journals. The cleft palate-craniofacial journal is the first rank with the citations of 12.24%. Among 73 journals, four were Thai journals, including Journal of the Medical Association of



**Fig. 2** Percentage of citation classified by publication country area.



**Fig. 3** Percentage of citation classified by years after publication.

Thailand, Srinagarind Medical Journal, Journal of Plastic, Reconstructive & Aesthetic Surgery Thai, and Thai Journal of Oral and Maxillofacial Surgery (Table 4).

The majority of the 73 journals had impact factors (IFs), based on the Web of Science database (WoS) for foreign journals and from the TCI (Thaijournal citation index) Centre for Thaijournals. Of note, some journals have ended publications in some years, the IFs, therefore, were not available (Table 4).

#### Discussion

The research articles under the Center of Cleft Lip - Cleft Palate and Craniofacial Deformities published during the past five years (2010-2014) in JMAT were accounted for a total of 106. There were a small number of only four single-authored articles (3.77%) and this was relatively less than foreign countries, such as a science journal of Nigeria in the year 2005 with single-authored articles as the second rank<sup>(3)</sup> and the Rawal

Medical Journal of Pakistan which single-authored articles reached up to 23%<sup>(4)</sup>. The mean of author per article was 4, which may be explained by the interdisciplinary/multidisciplinary nature of the tasks of the center which related to many fields, mostly surgery, nursing, and dentistry. The mean of citation per article was 20, representing the standard in most science journals, and is similar to that of Brazilian medical journals which was 20.9<sup>(5)</sup> and that of research papers in dentistry which was 23.28<sup>(6)</sup>.

The majority of the first authors was staff of the Faculty of Medicine, Khon Kaen University. The Center of Cleft Lip - Cleft Palate and Craniofacial Deformities was a part of this Faculty, which worked cooperatively with other disciplines and thus made the interdisciplinary/multidisciplinary articles up to 70.67%.

The concept of interdisciplinary/multidisciplinary articles could be perceived from the first authors. However, nursing consists of many sub-fields, so there were fairly a lot of articles in the field of nursing. Other related core-fields demonstrated by the first authors were otorhinolaryngology, dentistry (orthodontics), plastic surgery, dentistry (oral diagnosis), neurosurgery, etc. There were many other related fields, such as community medicine, pediatrics, and medical records & statistics. As for the co-authors, more related fields were presented, such as radiology, anatomy, psychiatry, rehabilitation, anesthesiology, dentistry (community), social welfare, etc. This result of finding out various disciplines showed that the center works by involving a multidisciplinary team.

The citations in the research articles were from many sources. The five-year trend showed an increase in using journals gradually from 70.30% to 89.22% whilst using books decreased gradually from 23.15% to 8.62%. The citations from thesis, internet and other sources were still in a small number. The growth of usage of citations from journals conformed to those of Rawal Medical Journal with 49.52% (4), research projects in dentistry with 93.7%<sup>(6)</sup>, the American Journal of Public Health with 64.4%<sup>(7)</sup>, nursing education journals with 62.4% (8), online and print journals<sup>(9)</sup>, online journals in dentistry, nursing, and pharmacy<sup>(10)</sup>, and research papers of the Faculty of Medicine at Chulalongkorn University with 90% (11). The small number of website usage was similar to the field of public health with about 1.4% to 6.7%<sup>(7)</sup>.

The trend of citations using foreign sources has been increased from 78.17% to 90.30%, opposing to Thai sources, which decreased from 21.83% to 9.70%. The possible reasons may be that there were a vast

 Table 4. Ranking of journal source citation

Title #	Ranking #	Journal title	IF	# of citation	Cumulative # of citation	%	Cumulative %
1	1	The Cleft palate-craniofacial journal	1.106	204	204	12.24	12.24
2	2	Plastic and reconstructive surgery	3.328	84	288	5.04	17.28
3	3	American journal of orthodontics and dentofacial orthopedics	1.437	67	355	4.02	21.30
4	4	Journal of the Medical Association of Thailand*	0.072	60	415	3.60	24.90
5	5	The Cleft palate journal (Ended 1990)	n/a	50	465	3.00	27.90
5	6	International journal of pediatric	1.319	43	508	2.58	30.48
		otorhinolaryngology					
7	7	The Angle orthodontist	1.277	42	550	2.52	33.00
3	8	European journal of orthodontics	1.390	30	580	1.80	34.80
)		Srinagarind medical journal (Thai journal)*	0.235	30	610	1.80	36.60
10	9	The Journal of craniofacial surgery	0.676	25	635	1.50	38.10
11	10	American journal of orthodontics (ended 1986)	n/a	24	659	1.44	39.54
12		Journal of oral and maxillofacial surgery	1.280	24	683	1.44	40.98
13	11	Annals of plastic surgery	1.458	22	705	1.32	42.30
14	12	Scandinavian journal of plastic and reconstructive surgery and hand	0.546	21	726	1.26	43.56
15	13	surgery (ended 2009) British journal of plastic surgery (ended 2005)	1.291	19	745	1.14	44.70
16	14	The Journal of trauma (ended 2011)	2.478	15	760	0.90	45.60
7	15	International journal of language & communication disorders	1.392	14	774	0.84	46.44
18		Journal of cranio-maxillo-facial surgery	2.597	14	788	0.84	47.28
19	16	The British journal of oral & maxillofacial surgery	1.133	13	801	0.78	48.06
20		Folia phoniatrica et logopaedica	0.550	13	814	0.78	48.84
21	17	American journal of medical genetics (ended 2002)	n/a	11	825	0.66	49.50
22		Seminars in orthodontics	n/a	11	836	0.66	50.16
23	18	Clinics in plastic surgery	1.350	10	846	0.60	50.76
24		Journal of anatomy	2.227	10	856	0.60	51.36
25	19	The Annals of otology, rhinology and laryngology	1.054	8	864	0.48	51.84
26		ASHA (ended 1999)	n/a	8	872	0.48	52.32
27		Journal of clinical orthodontics: JCO	n/a	8	880	0.48	52.80
28		Journal of neurosurgery	3.227	8	888	0.48	53.28
29		Journal of orofacial orthopedics	0.819	8	896	0.48	53.76
30		Pediatrics	5.297	8	904	0.48	54.24
31	20	Acta odontologica Scandinavica	1.309	7	911	0.42	54.66
32		British journal of orthodontics (ended 1999)	n/a	7	918	0.42	55.08
33		Critical care medicine	6.283	7	925	0.42	55.5
34		International journal of oral and maxillofacial surgery	1.359	7	932	0.42	55.92
35		The Journal of pediatrics	3.736	7	939	0.42	56.34
36		Laryngoscope	2.032	7	946	0.42	56.76
37	21	American journal of medical genetics. Part A	2.048	6	952	0.36	57.12
38		American journal of ophthalmology	4.021	6	958	0.36	57.48
39		European journal of cardio-thoracic surgery	3.048	6	964	0.36	57.84

<sup>\*</sup> Thai journal

Table 4. Cont.

Title #	Ranking #	Journal title	IF	# of citation	Cumulative # of citation	%	Cumulative %
40		Journal of advanced nursing	1.685	6	970	0.36	58.2
41		Journal of dental research	4.144	6	976	0.36	58.56
42		Journal of speech and hearing research (ended 1996)	n/a	6	982	0.36	58.92
43		Pediatric dentistry	1.622	6	988	0.36	59.28
44		Transplantation proceedings	1.027	6	994	0.36	59.64
45	22	Acta neurochirurgica	1.391	5	999	0.30	59.94
46		Journal of the American Dental Association (1939)	1.698	5	1004	0.30	60.24
47		The Journal of laryngology and otology	0.700	5	1009	0.30	60.54
48		Journal of oral surgery (ended 1981)	n/a	5	1014	0.30	60.84
49		Oral surgery, oral medicine	n/a	5	1019	0.30	61.14
50		and oral pathology (ended 1994)	1 220	_	1004	0.20	C1 44
50		Otolaryngology-head and neck surgery	1.339	5	1024	0.30	61.44
51		Retina	3.177	5	1029	0.30	61.74
52	22	Ultrasound in obstetrics & gynecology	3.140	5	1034	0.30	62.04
53	23	Acta ophthalmologica	2.512	4	1038	0.24	62.28
54		Annals of the Academy of Medicine, Singapore	n/a	4	1042	0.24	62.52
55		Archives of otolaryngology (ended 1985)	n/a	4	1046	0.24	62.76
56		Asia Pacific journal of speech, language and hearing (ended 2012)	n/a	4	1050	0.24	63
57		The British journal of dermatology	4.100	4	1054	0.24	63.24
58		The British journal of ophthalmology	2.809	4	1058	0.24	63.48
59		European urology	12.480	4	1062	0.24	63.72
60		The Journal of burn care & rehabilitation (ended 2005)	2.421	4	1066	0.24	63.96
51		Journal of developmental and behavioral pediatrics: JDBP	2.353	4	1070	0.24	64.2
62		Journal of endourology/endourological society	2.095	4	1074	0.24	64.44
63		Journal of plastic, reconstructive & aesthetic surgery: JPRAS	1.474	4	1078	0.24	64.68
64		Journal of plastic, reconstructive & aesthetic surgery Thai*	n/a	4	1082	0.24	64.92
65		Journal of speech, language and hearing research: JSLHR	11.926	4	1086	0.24	65.16
66		Journal of ultrasound in medicine	1.532	4	1090	0.24	65.4
67		Oral surgery, oral medicine, oral pathology and oral radiology	1.265	4	1094	0.24	65.64
68		Pediatric nephrology	2.881	4	1098	0.24	65.88
59		Prenatal diagnosis	2.514	4	1102	0.24	66.12
70		Social science & medicine	2.558	4	1102	0.24	66.36
71		Stroke; a journal of cerebral circulation	6.018	4	1110	0.24	66.6
71 72		Teratology	0.018 n/a	4	1110	0.24	66.84
73		Thai Journal of Oral and Maxillofacial Surgery *	n/a n/a	4	1114	0.24	67.08
74-	24-26	(406 journal titles with 3 down to 1 citation)					(32.92)
479		Total		1667	1667	100	100

<sup>\*</sup> Thai journal

number of foreign citations and the search from worldwide could be performed easier. This result was similar with a study conducted in Brazil showing 86.00% of citations were from abroad<sup>(5)</sup>.

Concerning the age of the citations, during 2010-2014, the use of citations aged between 1 to 5 years has increased from 19.65% to 25.34% whereas the use of those aged more than 10 years has decreased from 62.45% to 47.17%. The use of citations aged 6-10 years was remaining steady. The results which show a trend of using more new citations may be because health science research needs more updated content of information. This is similar to the field of public health which 50.30% of citations aged between 0-5 years, and dentistry found more than 50% of citations were recently 10 years<sup>(6,7)</sup>.

All 1,667 citations from 479 journals were those listed in the journals that have been ranked. The majority of the top 73 journals had IF from 0.072 to 12.480. The comparison of the IF helped to clarify the accepted quality of those cited journals. Among the top 73 journals, four were Thai journals, which were remarkably published by an educational institute, a professional association and two societies, rather than published by a trade company.

When classifying the journal citations based on Bradford's Law, which mentioned the scattering of three zones of equal citations in science journals, the cited journals could be observed meaningfully (Table 4). The first zone comprised 7 journals with 550 citations. The second zone was 66 journals with 568 citations and the third zone was 406 journals with 549 citations. The first zone could be core journals because those journals were most cited, i.e. 1) The Cleft Palate-Craniofacial Journal, 2) Plastic and Reconstructive Surgery, 3) American Journal of Orthodontics and Dentofacial Orthopedics, 4) Journal of the Medical Association of Thailand, 5) The Cleft Palate Journal (Ended publication in 1990 and resumed with changed name, which has a different ISSN), 6) International Journal of Pediatric Otorhinolaryngology, and 7) The Angle Orthodontist. This classification helps the researchers and library to select the qualified journals for their study or publishing. However, some specific journals may be examined more thoroughly in order to acquire worthwhile resources for the research work of the center.

## Conclusion

During the years 2010 to 2014, Khon Kaen University Center of Cleft Lip - Cleft Palate and

Craniofacial Deformities cooperated with the Medical Association of Thailand in publishing five special issues of JMAT comprising more than one hundred research articles. These articles showed the collaboration of the teamwork from many related fields in cleft lip - cleft palate and craniofacial deformities. The articles were mostly interdisciplinary and multidisciplinary and the authors were the staff in and out of the Faculty of Medicine, Khon Kaen University. The citation characteristics demonstrated growing trends in using journals and foreign sources with more recent years. The analyzed ranking list of cited journals provided useful sources for our center in the acquisition of qualified journals and in the consideration for promoting its academic works through publications.

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#### What was already known on this topic?

There had been no previous study in this topic.

#### What did this study adds?

This study shows all the findings as discussed and concluded above.

# Potential conflicts of interest

None.

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ลักษณะการอ้างอิงของบทความวิจัยของศูนย์วิจัยผู้ป่วยปากแหว่งเพดานโหว่และความพิการแต่กำเนิดของศีรษะและใบหน้า มหาวิทยาลัยขอนแก่น

สุดใจ ธนไพศาล, ไชยวิทย์ ธนไพศาล, สุขุมาล ธนไพศาล

สูนย์วิจัยผู้ป่วยปากแหว่งเพดานโหว่และความพิการแต่กำเนิดของศีรษะและใบหน้า มหาวิทยาลัยขอนแก่น ได้ร่วมมือกับแพทยสมาคม
แห่งประเทศไทยในพระบรมราชูปถัมภ์ จัดทำวารสารจดหมายเหตุทางแพทย์ฯ (จพสท.) ฉบับพิเศษ นับตั้งแต่ปี พ.ศ. 2553 จนถึงปี พ.ศ. 2557
รวมจำนวน 5 ฉบับ เพื่อเป็นการเผยแพร่งานวิจัยออกสู่วงกว้างมากขึ้น งานวิจัยนี้ศึกษาเพื่อให้ทราบถึงลักษณะของบทความวิจัยจำนวน 106 เรื่อง
ในวารสารฉบับดังกล่าวในส่วนที่เป็นผู้แต่ง ความเป็นสหสาขาวิชา ลักษณะของรูปแบบการอ้างอิงท้ายบทความเพื่อวิเคราะห์ถึงประเภทของงานอ้างอิง
แหล่งที่มาของงานอ้างอิง อายุของงานอ้างอิงที่นำมาใช้ นอกจากนั้นได้ศึกษาถึงงานอ้างอิงในรูปของวารสารโดยจัดลำดับความสำคัญของวารสารที่นำมาใช้
เปรียบเทียบกับค่าดัชนีผลกระทบการอ้างอิงและทฤษฎีว่าด้วยกฎแบรดฟอร์ด ผลจากการศึกษาจะเป็นประโยชน์ต่อการพัฒนาปรับปรุงงานวิจัยของศูนย์วิจัย
ผูป่วยปากแหว่งเพดานโหวฯ ในเชิงที่เน้นการทำงานสหสาขาวิชามากขึ้น และช่วยในการจัดหาวารสารวิชาการที่จะใช้เป็นแหล่งอ้างอิงที่สำคัญของงานวิจัย
ของศูนย์ฯ ได้ค่อไป