International Journal of Applied Dental Sciences 2018; 4(3): 281-283

ISSN Print: 2394-7489
ISSN Online: 2394-7497
IJADS 2018; 4(3): 281-283

www.oraljournal.com
Received: 12-05-2018
Accepted: 13-06-2018

Funda Fundaoğlu Küçükekenci
Ordu Dental Public Center, Ordu, Turkey

Süleyman Kutalmış Büyük
Ordu University, Faculty of Dentistry, Department of Orthodontics, Ordu, Turkey

Ahmet Serkan Küçükekenci
Ordu University, Faculty of Dentistry, Department of Prosthodontics, Ordu, Turkey

Ahmet Karaman
Ordu University, Faculty of Dentistry, Department of Orthodontics, Ordu, Turkey

Correspondence
Ahmet Serkan Küçükekenci
Ordu University, Faculty of Dentistry, Department of Prosthodontics, Ordu, Turkey

Investigation of the one hundred most cited papers in shear bond strength in dentistry

Funda Fundaoğlu Küçükekenci, Süleyman Kutalmış Büyük, Ahmet Serkan Küçükekenci and Ahmet Karaman

Abstract
Aim: The aim of this bibliometric study was to analyze the most frequently cited article about shear bonding strength (SBS) in dentistry.
Materials and Methods: This study was conducted to obtain citation information on SBS articles by using the Science Citation Index (SCI) and the Extended Science Citation Index (SCI-E) from Web of Science. The most top-cited SCI and SCI-E articles were included in this study by using the 'Shear Bond Strength' search term in March 2017. Information about the name and impact factor of the journal, the number of citations, the year of publication, the authors, the country and the field of study were recorded.
Results: The 100 top-cited articles most frequently for the work done with SBS in the field of dentistry, 24 articles are the most common areas of orthodontics, while 17 articles are the areas of prosthetic dentistry and general dentistry. The studies by Samir E. Bishara had the highest volume of total citations with 7 articles among the first top-cited 100 articles.
Conclusions: The 100 top-cited articles about the SBS are mostly in orthodontics and prosthodontics areas.

Keywords: Bibliometric analysis, citation, shear bond strength, dentistry

1. Introduction
The bonding of adhesive resins to the enamel prisms that are roughened with phosphoric acid occurs due to the mechanical locking-in between them and the resin tags [1, 2]. The chemical compound and the structure compound of the dentin structure are different from the enamel. While there are too many dentine tubules in the dentine tissue as well as water and organic material more than the enamel, the mineral tissue is less than the enamel. Due to the chemical and biological structure of the dentine, the bond strength of the adhesive resins occurs less than the enamel [3]. The conventional adhesive systems used in bonding the orthodontic brackets to the enamel surface consist of the enamel, primer solution and adhesive resin [4, 5]. Before orthodontist places bracket to the teeth, it must be ensured that the bonding surface is dry because water and saliva contamination reduces the bonding strength of the adhesive resin [6]. In addition to this, the type of the acid, its concentration and the duration of the etching duration affect the bonding strength [7, 8]. After the introduction of the direct bonding of the orthodontic brackets, many studies have been conducted on the bonding strength between the bracket and the enamel surface [9, 10].
The studies that investigate the cumulative scientific data on a certain topic and that assess the performance of scientific publication are called bibliometric analysis studies. Bibliometric studies help the researcher to investigate the data of the literature, compare the scientific performance of institutions and determine the important points of research focus [11].
Scientific articles are important publication organs that establish the connection between the production and use of the information. The term “refer” is indicating to the publication of a scientific study by another article. References are used in assessing the scientific publications in institutional or private, national or international fields. The assessment of a publication on a certain topic is the criterion of its productivity [12]. Too many references are made to important publications in any scientific field [13]. The Web of Science (WOS) is a research platform that provides permission for access to important reference databases of the world and enables researchers to refer to the references of articles [14]. Today, many reference analyses and top-cited articles are found for many specialty fields.

Bibliometric data ensure that researchers discover certain areas. In other words, although reference index is not accepted as the criterion of importance or quality, it is accepted commonly as the recognition criterion [15]. In this study of ours, a hundred articles on bond strength that were referred to in the field of dentistry at the highest level were analysed.

2. Materials and Methods

This study was conducted to obtain citation information on published articles about bonding strength using the Science Citation Index (SCI) and the Science Citation Index-Expanded (SCI-E) from the Institute for Scientific Information (ISI) Web of Science. In the dentistry literature, articles reporting and publishing the study design were included. The articles that report studies in other disciplines are not included in the analysis. Also, editorial comments were not included in this study. The ethics committee approval is not required for present study because of on Web of Science literature scanning.

2.1. Search and Selection of Articles

Using the search term 'Shear Bond Strength', the first 100 published from March 1975 to March 2017, with the highest number of references cited by SCI and SCI-E journals were included. All these articles are listed by the number of citations to which a list of articles is included.

Information about the name of the journal, the impact factor (IF) of the journal, the number of citations, the year of publication, the authors, the country and the field of dentistry, which are more than two articles, were recorded. In addition, the types of work were determined by double-checking based on titles and summaries.

The search and selection of the articles was independently performed by two authors (F. F. K. and A. S. K.).

3. Results

Although the effect value of the 1.472 for the year 2016 for *American Journal of Orthodontics and Dentofacial Orthopedics*, it ranks the first among the other dentistry journals with 29 articles among 100 articles that are referred to about the best bonding strength. Although the effect value of the *Journal of Dental Research* is 4.755, it has 4 articles in 100 articles that are referred to at the highest level (Table 1).

Although field of orthodontics ranks the first with 24 articles in 100 articles that are referred to at the highest level in the field of bonding strength in dentistry the fields of prosthetic dentistry and general dentistry fields come after it with 17 articles each. While the United States of America is the country that is referred to at the highest level in the field of bonding strength with 49 articles, Japan follow the United States of America with 9 articles, and Turkey ranks the 4th among countries with 6 articles. Samir E. Bishara is the author that is referred to at the highest level with 7 articles among 100 articles on bonding strength, and the Turkish author Mutlu Özcan has 2 articles. In addition, while 9 of the 100 articles referred to at the highest level were published in 2005, the year 1998 ranks the second after it with 8 articles.

4. Discussion

In the present study, it was shown that the first 100 articles referred to at the highest level on shear bonding strength have similar features. When the 100 articles that are referred to at the highest level are examined, it is seen that these articles are mostly released in the field of Orthodontics and in the United States of America. Studies were conducted mostly on the comparison studies. It was shown that most of the 100 articles referred to at the highest level on bonding strength in dentistry were released approximately 10-20 years ago.

The articles referred to at the highest level were the ones released by Samir E. Bishara on bonding strength in the field of Orthodontics. When these articles were examined it was concluded that the bonding strength of orthodontic brackets is an extremely important topic in Orthodontics. In our study, it was determined that the articles that were referred to at the highest level on bonding strength that ranked second were in the field of prosthetic dental treatment.

The limitation of the present study is the use of annual average reference numbers in the ranking of the articles instead of ranking based on absolute reference numbers. The benefit of number of referencing in annual base in average considers the advantage of the older articles because they can be referred for longer durations. Loonen *et al.* [16] stated that older articles that receive reference at high rates cannot continue to be referred or they will become the “classics” of the future. Another limitation of the present study of ours is the fact that ISI-WOS does not have a feature that detects the authors who refer to themselves (self-citation) in an automatic manner. In addition, the WOS database does not include the references made in books or in other languages, which is another limitation. When conducting a bibliometric or academic study, researchers make use of alternative databases like Google Academic or Scopus; however, it was reported in previous studies that although there are bigger reference records in these databases, they are less effective in citing the references in older articles [17].

Table 1: The most cited articles in the shear bond strength in different journals.

Journal Name	(2016-IF)	5 years IF	Number of most cited articles
American Journal of Orthodontics and Dentofacial Orthopedics	1.472	2.002	29
Dental Materials	4.070	5.155	20
Journal of Prosthetic Dentistry	2.095	2.201	16
American Journal of Dentistry	0.760	1.225	10
Operative Dentistry	2.893	2.520	7
Journal of Dental Research	4.755	5.016	4
The Angle Orthodontics	1.366	1.619	3
International Journal of Prosthodontics	1.386	1.691	2
Acta Odontologica Scandinavica	1.232	1.387	1
International Endodontics Journal	3.015	3.089	1
Journal of Oral Rehabilitation	2.098	2.280	1
Journal of Dentistry	3.456	3.531	1
Journal of Adhesive Dentistry	2.008	1.919	1
Archives of Oral Biology	1.748	1.991	1
Clinical Oral Investigations	2.308	2.454	1
Journal of Endodontics	2.807	3.182	1
Lasers in Surgery and Medicine	2.312	2.610	1

5. Conclusions

The present study of ours in which we evaluated the first 100 articles conducted on bonding strength in dentistry is the first one conducted in this field. There are several missing points in the WOS, which is a reliable source in evaluating the number of the references made to relevant articles and in article screening. When these missing points are corrected, and up-to-date algorithms are developed with artificial intelligence, the reliability of bibliometric studies will increase in further years.

8. References

1. Bowen RL, Cobb EN, Rapson JE. Adhesive bonding of various materials to hard tissues: Improvement in bond strength to dentin. J Dent Res. 1982; 61(9):1070-6.
2. Bowen RL, Cobb EN. A method for bonding to dentin and enamel. J Am Dent Assoc. 1983; 107(5):734-6.
3. Beech DR. Adhesion to teeth: principles and mechanisms. In: Smith DC, Williams DF, eds. Biocompatibility of dental materials, vol. II. Boca Raton, FL: CRC Press, 1982, 95.
4. Chigira H, Koike T, Hasegawa T, Itoh K, Wakumoto S, Hyakawa T. Effect of the self-etching dentin primers on the bonding efficacy of dentine adhesive. Dent Mater J. 1989; 8(1):86-92.
5. Nishida K, Yamauchi J, Wada T, Hosoda H. Development of a new bonding system. J Dent Res. 1993; 72:137.
6. Silverman E, Cohen M, Demke RS, Silverman M. A new light-cured glass ionomer cement that bonds brackets to teeth without etching in the presence of saliva. Am J Orthod Dentofacial Orthop. 1995; 108(3):231-6.
7. Retief DH. A comparative study of three etching solutions: effects on contact angle, rate of etching and tensile bond strength. J Oral Rehabil. 1974; 1(4):381-90.
8. Mulholland RD, DeShazer DO. The effect of acidic pretreatment solutions on the direct bonding of oahodontic brackets. Angle Orthod. 1968; 38(3):236-43.
9. Maijer R, Smith DC. Variables influencing the bond strength of metal orthodontic bracket bases. Am J Orthod Dentofacial Orthop. 1981; 79(1):20-34.
10. Johnson WT, Hembree JH, Weber FM. Shear strength of orthodontic direct bonding adhesives. Am J Orthod Dentofacial Orthop. 1976; 70(5):559-66.
11. Yılmaz S, Bakış M. A Bibliometric Analysis of Scientific Publications from Turkey and the World in the Field of Anesthesiology. Turkiye Klinikleri J Anest Reanim. 2014; 12(3):143-7.
12. Wiysonge CS, Uthman OA, Ndumbe PM, Hussey GD. A bibliometric analysis of childhood immunizaton research productivity in Africa since the onset of the Expanded Program on Immunizaton in 1974. BMC Med. 2013; 11:66.
13. Powell AG, Hughes DL, Wheat JR, Lewis WG. The 100 most influental manuscripts in gastric cancer: A bibliometric analysis. Int J Surg. 2016; 28:83-90.
14. Hui J, Han Z, Geng G, Yan W, Shao P. The 100 top-cited articles in orthodontics from 1975 to 2011. Angle Orthod. 2013; 83(3):491-9.
15. Tsai YL, Lee CC, Chen SC, Yen ZS. Top-cited articles in emergency medicine. Am J Emerg Med. 2006; 24(6):647-54.
16. Loonen MP, Hage JJ, Kon M. Plastic Surgery Classics: characteristics of 50 top-cited articles in four Plastic Surgery Journals since 1946. Plast Reconstr Surg. 2008; 121(5):320-7.
17. Bakkalbasi N, Bauer K, Glover J, Wang L. Three options for citation tracking: Google Scholar, Scopus and Web of Science. Biomed Digit Libr. 2006; 29:3-7.