Review Article

AN ALGORITHMIC APPROACH OF EVIDENCE-BASED DENTISTRY- REVIEW

ABSTRACT:

Evidence-based practice is mainly based on scientific evidence, nowadays there is an increasing approach towards research-based studies, there are various steps in choosing the criteria, steps in writing, level of grading, and various search engines have been mentioned, such as google scholar, PubMed, etc. finally we have various other criteria for selecting and writing the final article, it is very important to choose a proper website for publishing our article. In recent years, practice of dentistry has become more complex and challenging, because of its advancement on a daily basis, so it is very important to analyse and update the current. iSeek is also a particular type of search engine for students, teachers, and administrators alike. The main aim is to provide a balanced mix of knowledge with science for the clinical expertise, and at same time which helps to know the needs of the patient so that optimizing patient care in a practice would not be underestimated.

Key words: Evidence-based dentistry, qualitative research, critical appraisal, innovation.

INTRODUCTION:

In the current generation, practitioners have been expected to cope up with the recent advancements in both theory-based as well as practical works. Evidence-based practice is mainly based on two principles: The recognition that scientific evidence alone is insufficient to guide decision making; and Within available sources of evidence, hierarchies exist (1).

EVIDENCE-BASED MEDICINE:

During the last decade, the concept of Evidence-Based Medicine (EBM) caused great interest among health professionals. Especially in growing fields like medicine, According to definition Evidence-Based Medicine represents the integration of clinical expertise, patient values, and best available evidence which helps in decisions making related to patients' health care(2). EBM aims to encourage the general practitioner in primary care to look for and make significant sense of the evidence available to apply it to daily clinical issues. However, making clinical decisions based on evidence does put up several pre-issues for the practitioner (3).

In developing appropriate treatment plans, the main aim of doctors should combine the patient's treatment needs and preferences with the best available sources, in conjunction with the doctor's clinical expertise(4). It has been found that only 10% of medical experience is based on validated research. It may take 17–20 years to implement the research-based knowledge to patient care (5).(6).(7–20) ,(21–25)

By better illustrating the evidence from the study, this branch of evidence-based medicine seeks to make individual decision-making more systematic and objective. Population-based data are applied to the care of an individual patient (26) while respecting the fact that practitioners have clinical expertise reflected in effective and efficient diagnosis and thoughtful identification and compassionate use of individual patients' predicaments, rights, and preferences (27).

EVIDENCE-BASED SCIENCE:

Effective science communication can empower research and innovation systems to address global challenges and put public interests, which helps in the development of knowledge, shared, and applied. For science communication to play this mediating role effectively, we have to combine with recent advancement that is evidence-based teaching (28). The purpose of evidence-based teaching is to contribute to knowledge on the adoption levels of evidence-based teaching practices by faculty within a science degree program and inform our science curriculum review in practical terms (29).

STEPS IN EBD WRITING:

Selecting the topic:

A topic is the main, principle guiding the analysis of your research paper. Topics provide us with a structure for writing and a focus on what we want to say. Topics represent the core subject matter of scholarly communication and how we arrive at other topics of conversations and discover new knowledge.

The subject should be interesting to you (ideally, you should have come across a series of recent papers relevant to your line of work that require a critical summary), a significant aspect of the field (so that many readers would be interested in the analysis and enough material to write it), and a well-defined question. (Otherwise, you could potentially include thousands of publications, which would make the review unhelpful)(30).

Visualization along with research presentations and communication is one of the most important components due to its ability to synthesize large amounts of data into effective graphics (31).

Criteria for choosing the articles:

All articles in a journal issue should have basic criteria which makes it complete for selecting our articles. The basic criteria include,

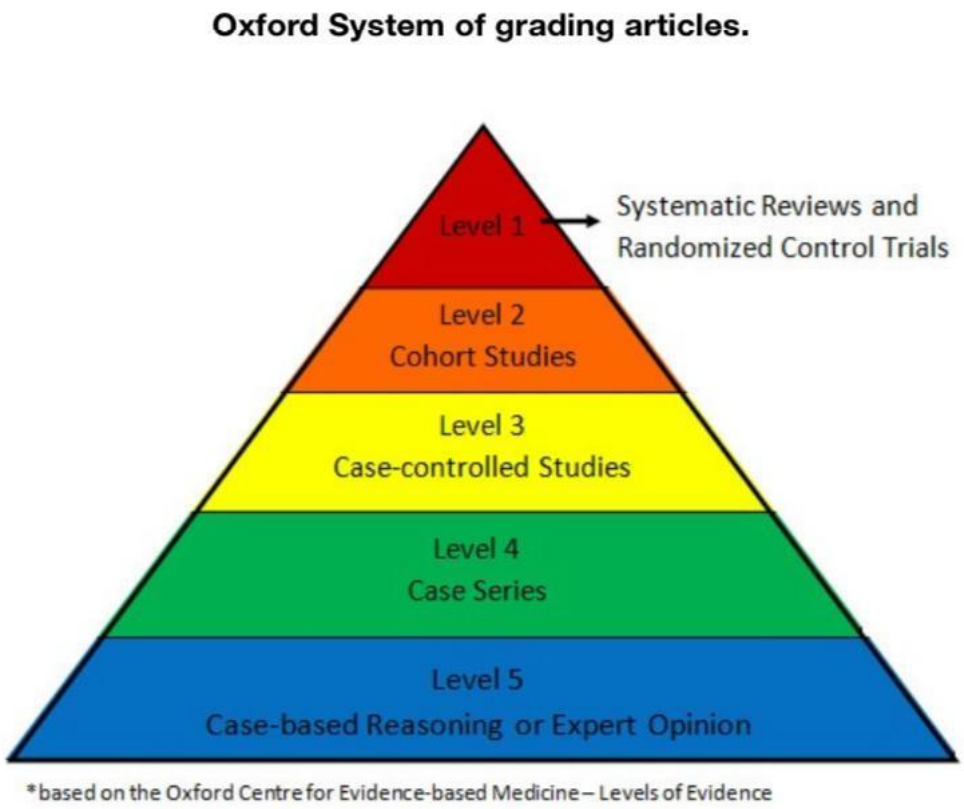
- Original or review articles
- In English
- Quantitative and qualitative studies
- About topics that are important to the clinical practices
- Analysis of each article is consistent with the study question (32).
- Level/grading the articles

Table 1: Oxford center for evidence-based medicine levels of evidence

Evidence Level	Therapy/ Prevention, etiology/ Harm	Prognosis	Diagnosis	Differential Diagnosis/ Symptom Prevalence Study	Economic And decision analyses
1a	Systematic Review of RCT	Systematic Review of Cohort studies	Systematic Review of Level 1 Diagnostic Studies	Systematic review of Prospective Cohort Studies	A systematic review of level 1 Economic Studies
1b	Individual RCT with Narrow Confidence Intervals	Individual Inception Cohort study with >80% Follow up	Validating Cohort study with good reference standards	Prospective Cohort study with good follow up	Analysis based on Clinically Sensible Costs or alternative, a systematic review of evidence. Multi-way sensitivity analysis included
2a	systemic Review of Cohort studies	systematic Review of Either retrospective	A systematic review of level >2 diagnostic studies	systematic review Of level >_2 b studies	A systematic review of level >2 economic studies

		cohort studies or untreated control groups in RCT			
2b	Individual Cohort study (including low-quality RCT; eg,< 80% follow up)	retrospective cohort study or follow up of untreated control patients in RCT	Exploratory cohort Study with good reference standards	Retrospective cohort study or proof follow up	analysis based on clinically sensible costs or alternatives A limited review of the evidence or single studies. Multiway sensitivity analysis included
2c	Outcomes research; Ecological studies	'outcomes' Research		ecological studies	audit or 'outcome' Research
3a	Systematic Review of Case-control studies		A systematic review of level>_ 3b studies	A systematic review of level >_ 3b studies	A systematic review of >_3b studies

Figure:1 Oxford System of Grading Articles



SEARCH ENGINES:

Search engines are the programs that are used to search the information on the various topic worldwide, the use of search engine has been increasing rapidly, it not only provides daily information needs where it helps us to understand, clears our doubts, clarifies Evidence-Based things, but it also helps us to fulfill our curiosity, etc(33)

We have various list of search engines which helps us in number of ways for research, assignment, knowledge, etc

Google Scholar

Google Scholar is the clear number one SEARCH ENGINE SITE which is considered as the topmost in all search engine sites. Many research papers are published on this site. By using keywords it helps us to search relevant articles based on our topic. Coverage included approximately 200 million articles. It consists of a simple form of abstract, related articles, references, citations, and links to the full text. The Export formats include APA, MLA, Chicago, Harvard, Vancouver, RIS, BibTeX.(34)

Microsoft Academic:

It's Microsoft's answer to Google Scholar. It is considered as the top-cited article and it consists of reference articles as well. It contains abstract, related articles, references, the link's to full text, it consists of formats which export, such as APAS, MLA, BibTeX

Coverage: approx. 210 million articles.(34)

BASE:

The BASE is hosted at Bielefeld University in Germany and that's where from (Bielefeld Academic Search Engine). Approximately it consists of 136 articles. It contains abstracts and links to full text, but it doesn't have a related articles list, references, and citations of the relevant article. The Export formats include RIS, BibTeX. (34)

iSeek:

iSeek is also a particular type of search engine for students, teachers, and administrators alike. This search engine helps students to get the required information about the given topic through various resources present on the World Wide Web. (34)

PubMed Central:

This search engine is very useful for those doing their work on science-related topics, it has been operated by National Biotechnology, it includes various citations and abstracts in a simple format which helps us to understand better. (34)

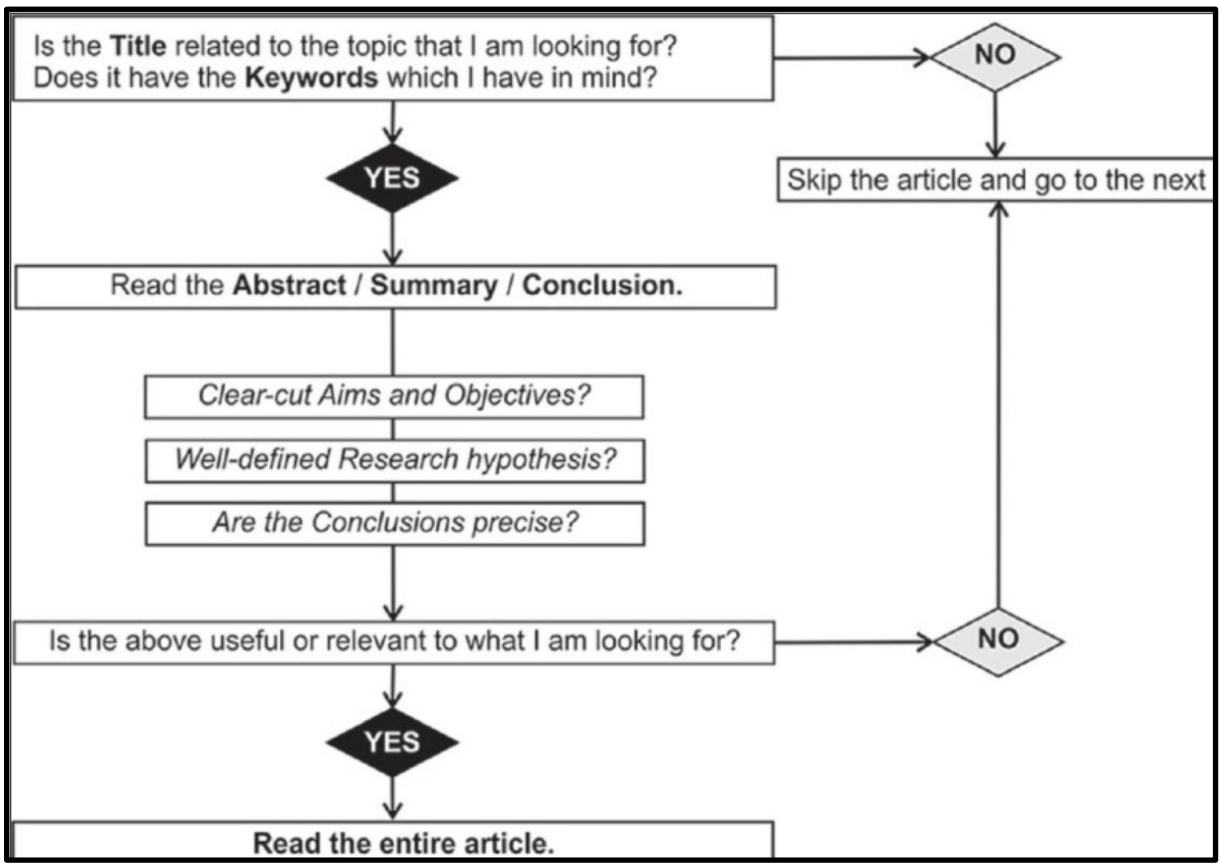
SELECTING THE FINAL ARTICLE:

When selecting a journal for publication, the introduction should be short and crisp which attracts the reader, and it should contain a good starting point, the next step is analyzing the editorial quality of research. Plagiarism checks using various methods such as iThenticate, using different statistical testing to confirm data validity, and applying forensic tools to detect image manipulation(35).

The introduction should have brief descriptions of the topic. This helps us to understand well about the topic, materials and methods are very important as it guides you the initial step towards your research. It provides us with technical details of how the experiments were carried out.

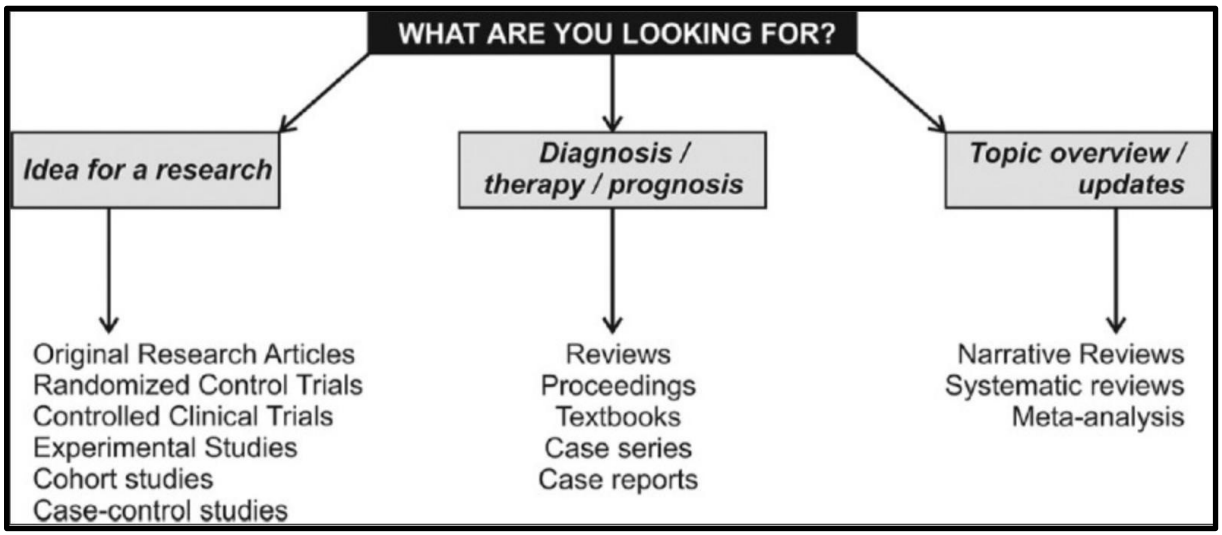
In some articles it may be research-based, review, or even a questionnaire will be provided for the survey. It would be better if you have diagrammatic representation like graphs, flow charts, tabular columns as well.

Figure 2: Steps For Framing Article



An article published in a peer-reviewed journal is more valued than one which is not. An original research article should consist of the following headings as Structured abstract, introduction, methods, results, and discussion and maybe Randomized Control Trial, Controlled Clinical Trial, Experiment, Survey, and Cohort study. If it is a review it may be systematic or unsystematic. A case study is the description of a particular case whereas case series is a description of the number of such case studies.

Figure 3: Categorisation of Study Designs included for Research.



The main part of the article is the discussion, where the research questions were answered, which helps in understanding, analyzing, and interpretation of data presented. The final one is the conclusion part where it gives the idea, results, future scope, advantages, and its disadvantages, limitations, Recap your key results, highlighting their significance concerning your aims in a precise manner.

CONCLUSION:

Evidence-based science is an outgrowing in the field of research. It helps us to understand the importance of articles for research, not only their importance but also how to choose an article based on our topic. The main aim is to provide a balanced mix of knowledge with science for the clinical expertise, and at same time which helps to know the needs of the patient so that optimizing patient care in a practice would not be underestimated.

REFERENCES:

1. Benjamin P. Promoting Evidenced-based Dentistry through "The Dental Practice-Based Research Network" [Internet]. Vol. 9, Journal of Evidence Based Dental Practice. 2009. p. 194–6. Available from: http://dx.doi.org/10.1016/j.jebdp.2009.06.014

2. Masic I, Miokovic M, Muhamedagic B. Evidence based medicine - new approaches and challenges. Acta Inform Med. 2008;16(4):219–25.

3. Richards D. Questions and answers in Evidence-based Dentistry Volume 14 [Internet]. Vol. 14, Evidence-Based Dentistry. 2013. p. 122–6. Available from: http://dx.doi.org/10.1038/sj.ebd.6400975

4. Richards D. Questions and answers in Evidence-based Dentistry volume 11 [Internet]. Vol. 11, Evidence-Based Dentistry. 2010. p. 119–22. Available from: http://dx.doi.org/10.1038/sj.ebd.6400762

5. Wallin LA. An Overview Of Evidence Based Dentistry Research [Internet]. Vol. 03, Dentistry. 2013. Available from: http://dx.doi.org/10.4172/2161-1122.1000176

6. Anita R, Paramasivam A, Priyadharsini JV, Chitra S. The m6A readers YTHDF1 and YTHDF3 aberrations associated with metastasis and predict poor prognosis in breast cancer patients. Am J Cancer Res. 2020 Aug 1;10(8):2546–54.

7. Jayaseelan VP, Paramasivam A. Emerging role of NET inhibitors in cardiovascular diseases. Hypertens Res. 2020 Dec;43(12):1459–61.

8. Sivakumar S, Smiline Girija AS, Vijayashree Priyadharsini J. Evaluation of the inhibitory effect of caffeic acid and gallic acid on tetR and tetM efflux pumps mediating tetracycline resistance in Streptococcus sp., using computational approach. Journal of King Saud University - Science. 2020 Jan 1;32(1):904–9.

9. Smiline Girija AS. Delineating the Immuno-Dominant Antigenic Vaccine Peptides Against gacS-Sensor Kinase in Acinetobacter baumannii: An in silico Investigational Approach. Front Microbiol. 2020 Sep 8;11:2078.

10. Iswarya Jaisankar A, Smiline Girija AS, Gunasekaran S, Vijayashree Priyadharsini J. Molecular characterisation of csgA gene among ESBL strains of A. baumannii and targeting with essential oil compounds from Azadirachta indica. Journal of King Saud University - Science. 2020 Dec 1;32(8):3380–7.

11. Girija ASS. Fox3+ CD25+ CD4+ T-regulatory cells may transform the nCoV's final destiny to CNS! J Med Virol [Internet]. 2020 Sep 3; Available from: http://dx.doi.org/10.1002/jmv.26482

12. Jayaseelan VP, Ramesh A, Arumugam P. Breast cancer and DDT: putative interactions, associated gene alterations, and molecular pathways. Environ Sci Pollut Res Int. 2021 Jun;28(21):27162–73.

13. Arumugam P, George R, Jayaseelan VP. Aberrations of m6A regulators are associated with tumorigenesis and metastasis in head and neck squamous cell carcinoma. Arch Oral

Biol. 2021 Feb;122:105030.

14. Kumar SP, Girija ASS, Priyadharsini JV. Targeting NM23-H1-mediated inhibition of tumour metastasis in viral hepatitis with bioactive compounds from Ganoderma lucidum: A computational study. pharmaceutical-sciences [Internet]. 2020;82(2). Available from: https://www.ijpsonline.com/articles/targeting-nm23h1mediated-inhibition-of-tumour-metastasis-in-viral-hepatitis-with-bioactive-compounds-from-ganoderma-lucidum-a-comp-3883.html

15. Girija SA, Priyadharsini JV, Paramasivam A. Prevalence of carbapenem-hydrolyzing OXA-type β-lactamases among Acinetobacter baumannii in patients with severe urinary tract infection. Acta Microbiol Immunol Hung. 2019 Dec 9;67(1):49–55.

16. Priyadharsini JV, Paramasivam A. RNA editors: key regulators of viral response in cancer patients. Epigenomics. 2021 Feb;13(3):165–7.

17. Mathivadani V, Smiline AS, Priyadharsini JV. Targeting Epstein-Barr virus nuclear antigen 1 (EBNA-1) with Murraya koengii bio-compounds: An in-silico approach. Acta Virol. 2020;64(1):93–9.

18. Girija As S, Priyadharsini J V, A P. Prevalence of Acb and non-Acb complex in elderly population with urinary tract infection (UTI). Acta Clin Belg. 2021 Apr;76(2):106–12.

19. Anchana SR, Girija SAS, Gunasekaran S, Priyadharsini VJ. Detection of csgA gene in carbapenem-resistant Acinetobacter baumannii strains and targeting with Ocimum sanctum biocompounds. Iran J Basic Med Sci. 2021 May;24(5):690–8.

20. Girija ASS, Shoba G, Priyadharsini JV. Accessing the T-Cell and B-Cell Immuno-Dominant Peptides from A.baumannii Biofilm Associated Protein (bap) as Vaccine Candidates: A Computational Approach. Int J Pept Res Ther. 2021 Mar 1;27(1):37–45.

21. Arvind P TR, Jain RK. Skeletally anchored forsus fatigue resistant device for correction of Class II malocclusions-A systematic review and meta-analysis. Orthod Craniofac Res. 2021 Feb;24(1):52–61.

22. Venugopal A, Vaid N, Bowman SJ. Outstanding, yet redundant? After all, you may be another Choluteca Bridge! Semin Orthod. 2021 Mar 1;27(1):53–6.

23. Ramadurai N, Gurunathan D, Samuel AV, Subramanian E, Rodrigues SJL. Effectiveness of 2% Articaine as an anesthetic agent in children: randomized controlled trial. Clin Oral Investig. 2019 Sep;23(9):3543–50.

24. Varghese SS, Ramesh A, Veeraiyan DN. Blended Module-Based Teaching in Biostatistics and Research Methodology: A Retrospective Study with Postgraduate Dental Students. J Dent Educ. 2019 Apr;83(4):445–50.

25. Mathew MG, Samuel SR, Soni AJ, Roopa KB. Evaluation of adhesion of Streptococcus mutans, plaque accumulation on zirconia and stainless steel crowns, and surrounding gingival inflammation in primary molars: randomized controlled trial [Internet]. Vol. 24, Clinical Oral Investigations. 2020. p. 3275–80. Available from: http://dx.doi.org/10.1007/s00784-020-03204-9

26. Stevenson RG 3rd. The educational system's integration of evidenced-based principles: what are the obstacles in the dental school environment? J Evid Based Dent Pract. 2006 Mar;6(1):59–61.

27. Anderson JD. Applying evidence based dentistry to your patients [Internet]. Vol. 46, Dental Clinics of North America. 2002. p. 157–64. Available from: http://dx.doi.org/10.1016/s0011-8532(03)00056-9

28. Hayes C. Evidence based dentistry: Design architecture [Internet]. Vol. 46, Dental Clinics of North America. 2002. p. 51–9. Available from: http://dx.doi.org/10.1016/s0011-8532(03)00049-1

29. Weyant RJ. Evidence-Based Dentistry: The Foundation for Modern Dental Practice [Internet]. Vol. 63, Dental Clinics of North America. 2019. p. ix – x. Available from: http://dx.doi.org/10.1016/j.cden.2018.09.001

30. Gillette J, Matthews JD, Frantsve-Hawley J, Weyant RJ. The Benefits of Evidence-Based Dentistry for the Private Dental Office [Internet]. Vol. 53, Dental Clinics of North America. 2009. p. 33–45. Available from: http://dx.doi.org/10.1016/j.cden.2008.09.002

31. France K, Sollecito TP. How Evidence-Based Dentistry Has Shaped the Practice of Oral Medicine [Internet]. Vol. 63, Dental Clinics of North America. 2019. p. 83–95. Available from: http://dx.doi.org/10.1016/j.cden.2018.08.006

32. Queen AN. Evidence-based Dentistry and Its Role in Caring for Special Needs Patients [Internet]. Vol. 60, Dental Clinics of North America. 2016. p. 605–11. Available from: http://dx.doi.org/10.1016/j.cden.2016.02.002

33. Kurniasih N, Kurniawati N, Yulianti, Rahim R, Sujito, Ikhwan A, et al. The utilization of search engines by students of the Library and Information Science Program at Universitas Padjadjaran [Internet]. Vol. 1114, Journal of Physics: Conference Series. 2018. p. 012085. Available from: http://dx.doi.org/10.1088/1742-6596/1114/1/012085

34. Samadzadeh GR, Rigi T, Ganjali AR. Comparison of Four Search Engines and their efficacy With Emphasis on Literature Research in Addiction (Prevention and Treatment). Int J High Risk Behav Addict. 2013 Mar 12;1(4):166–71.

35. Sadler I. The influence of interactions with students for the development of new academics as teachers in higher education [Internet]. Vol. 64, Higher Education. 2012. p. 147–60. Available from: http://dx.doi.org/10.1007/s10734-012-9545-0