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Navigating through our history in research: An altmetric analysis for publications by the full-time operative dentistry faculty at the Aga Khan University Hospital in the past decade

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RESEARCH ARTICLE

Navigating through our history in research: An altmetric analysis for publications by the full-time operative dentistry faculty at the Aga Khan University Hospital in the past decade

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Abstract

Objective: To analyse the social dissemination of publications by fulltime faculty at a tertiary care facility.

Methods: The retrospective study was conducted at the Aga Khan University Hospital, Karachi, and comprised publication records of the fulltime Operative Dentistry faculty members between July 2011 till July 2021. The search was done on Google Scholar, Altmetric Explorer and PubMed electronic databases. After final screening, all the publications in PubMed-indexed journals, including in vitro studies, randomised controlled trials, original research articles, case reports and letters to the editor, for which the Altmetric Attention Score was available were included.

Results: Of the 225 publications identified, 34 (15%) formed the final sample. The cumulative citation count for the publications was 617 and Altmetric Attention Score was 158. There were 16 Facebook mentions and 163 tweets.

Conclusion: The social impact of publications by the Operative Dentistry faculty over a decade was not convincing in terms of Altmetric Attention Score.

Keywords: Traditional bibliometrics, Altmetrics, Altmetric Attention Score, AAS, Online attention, Social dissemination. (JPMA 72: S-30 [Suppl. 1]; 2022)
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Introduction

The Operative Dentistry residency programme in Pakistan dates back to 1995. However, at Aga Khan University Hospital (AKUH), the clinical training in this specialty of dentistry started in 2002, which with time has evolved into one of the finest training programmes in Pakistan. This is because in the past decade some fundamental changes were incorporated and a research curriculum was introduced to instill research skills in the residents at an early stage in their academic careers.[1] Since the trends in research are evolving, much greater emphasis is now being placed on practising evidence-based dentistry.

Nevertheless, with the emerging trends, research profile of the faculty is also improving as the number of local and international publications is increasing. This surge in the number of publications in the past decade, however, is accompanied by a dramatic improvement in the citation metrics as well.[1,2]

Citation count (CC) and its derivatives, such as impact factor (IF), H-index, and i10 index, are the traditional methods to evaluate the scientific performance of a publication.[3] However, it has certain shortcomings. Firstly, it provides insight only on the scientific value of a publication, and, thus, fails to describe the impact of

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research beyond the limits of an academic environment. Secondly, it may take years for a publication to be cited, thus the impact of recently published papers is generally underestimated.[4] Moreover, the "Matthew effect" can exist in the case of a citation. This effect is thought to be influenced by prestige of the author and his/her institutional affiliation.[5] Likewise, the disparity in citations may extend to include gender bias, location of publication, and the personal preference of citing an article published in a journal with a comparatively high IF.[5]

The rising influence of social media over the past decade has led to a paradigm shift as various platforms have been made available for researchers to share their scholarly ideas.[3] In this regard, the term alternative metrics, or altmetrics, was introduced in 2010 by Jason Priem.[3] These metrics in the real sense measure how much and what kind of online attention an item is receiving at any point in time, thus complementing traditional citation-based metrics.[3]

To capture the online activity around a published item, multiple aggregators are available, the most popular among which are Altmetric Explorer and Plum Analytics.[6] Likewise, different publishers use different resources for reporting these metrics.[6] Likewise, different publishers use different resources for reporting these metrics, for example, John Wiley & Sons and Springer Nature use Altmetric Explorer whereas Elsevier Publishing uses Plum

Analytics. Among local journals, the Journal of Pakistan Medical Association subscribes to both of these tools.

Altmetric Explorer is a fee-based subscription tool that aggregates information from different social media sources, like Twitter, Facebook, etc., traditional media, like the New York Times, The Guardian, etc., and online reference managers, like Mendeley, etc. It calculates an Altmetric Attention Score (AAS) using a specific algorithm, thereby generating a colour-coded badge, with each colour representing a different source.[6] The higher the online attention an article gets, the greater is the score. Likewise, Plum Analytics, also a fee-based tool, captures the online activities providing five categories of metrics namely: Usage, Captures, Mentions, Social media, and Citations.[4]

Almetrics hold a promising future considering the many potential advantages that it offers. The attention scores are updated daily, making it possible for recently published items to gain early recognition. In addition, they cover a broader spectrum of academic as well as non-academic audiences.[3] Moreover, a significant understanding is provided about how a publication is being used in terms of a recommendation, discussion, as well as citation, etc.[3]

Nevertheless, with the emerging influence of altmetrics in today's world, the research work in this area of interest is still lacking in Pakistani setting. To address the paucity, current study was planned to explore the social dissemination of publications by full-time faculty members.

Materials and Methods

The retrospective chart review was conducted at the AKUH, Karachi, and comprised publication records of the fulltime Operative Dentistry faculty members between July 2011 till July 2021. The search was done on Google Scholar, Altmetric Explorer and PubMed electronic databases.

With the consent of three fulltime faculty members, identified as MFRK, ROBG and FUMR, their publication data across the study years was collected from the databases. All search work was done by a single investigator in August 2021. Initially, the faculty's Google Scholar profile was searched, and the records were corroborated by the individual faculty to check for any incongruity. Later, to screen the records, Altmetric Explorer was searched using article titles and Digital Object Identifiers (DOIs) to have the Altmetric Attention Score (AAS). The records for which the Altmetric database did not yield any result were excluded. After final screening, the publications in PubMed-indexed journals, including all in vitro studies, randomised controlled trials (RCTs), original research articles, case reports and letters to the editor were included.
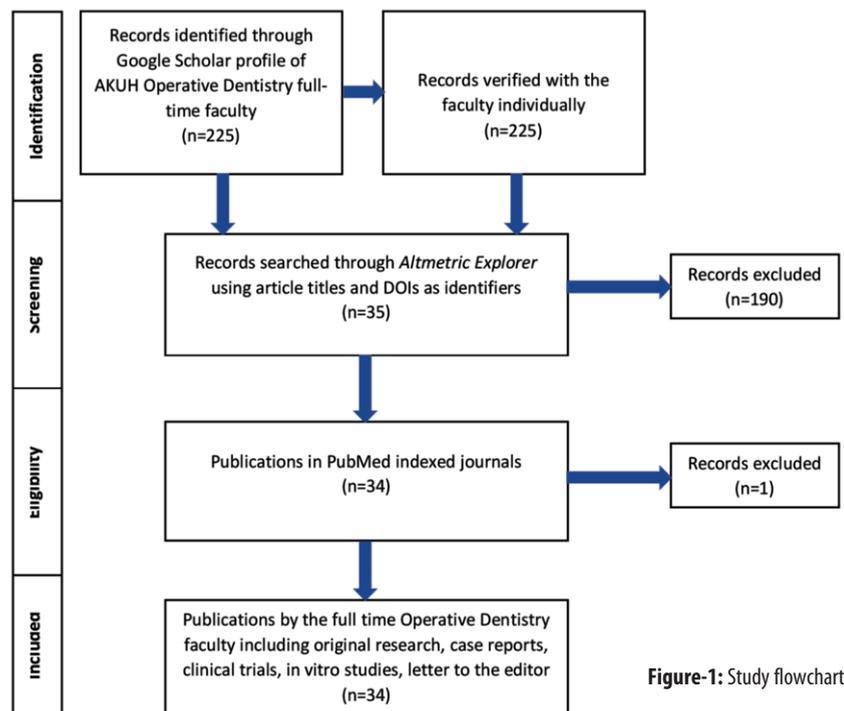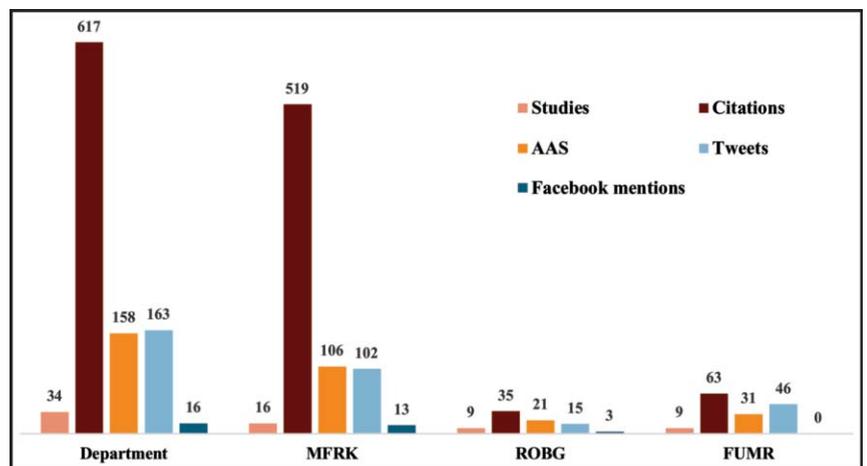

Figure-1: Study flowchart.

Figure-2: Faculty-wise breakdown of citation counts, Altmetric Attention Score (AAS), tweets and Facebook mentions.

Results

Of the 225 publications identified, 34(15%) formed the final sample (Figure-1). The cumulative citation count for the publications was 617 and AAS was 158. There were 16 Facebook mentions and 163 tweets. Among the three faculty members, MFRK had the greatest share in terms of the number of studies, citations and AAS (Figure-2).

In terms of geographic distribution, 104 (63.8%) of the tweets were of unknown origin, followed by 15 (9.2%) and 9 (5.52%) and 8 (4.9%) belonging to the United Kingdom, the United States and Pakistan, respectively (Figure-3).

As for demographic distribution, the tweets were most popular among the members of the general public 116(71.16%) followed by healthcare professionals 24 (14.72%) (Figure-4).

Geographic distribution	Number of tweets
Pakistan	8
United States	9
United Kingdom	15
Portugal	1
India	1
Ethiopia	1
Chile	1
Netherlands	1
Columbia	1
New Zealand	1
Japan	3
Saudi Arabia	4
Spain	9
Canada	3
Venezuela	1
Unknown	104

Figure-3: Geographic distribution of tweets.
Red colour denotes the highest value and green, the lowest value. The remaining values are assigned different gradients of the colour at the two extremes.

Figure-4: Demographic distribution of tweets.
Bubble sizes correspond to the number of Twitter mentions.

Discussion

The current study was planned to provide useful insight on the social impact of publications over the past decade.

Altmetrics came into existence in 2010 as an advanced metric to measure the social dissemination of a certain publication. In this context, the publications for which AAS was available on Altmetric Explorer for the study years were included. However, it was noted that most of the records were from 2016 onwards whereas only a single publication from 2013 was included in the study. This could be due to two reasons, either the Altmetric database was not able to retrieve the online attention data for the publications before 2016 or there was no social engagement of the publications before this time.

The results revealed that the major proportion of publications was captured by a single faculty member, MFRK, with 16 studies followed by the other two faculty members, ROBG and FUMR, with 9 studies each. Likewise, the CC, AAS, tweets and Facebook mentions were also significantly higher for MFRK. Moreover, it was found that among the other two faculty members with same number of publications, FUMR had greater CC, AAS and the number of tweets. In contrast, Facebook mentions for ROBG were higher whereas FUMR had virtually no online attention in terms of Facebook mentions. This disparity in social impact could be due to the individual faculty's preference for a
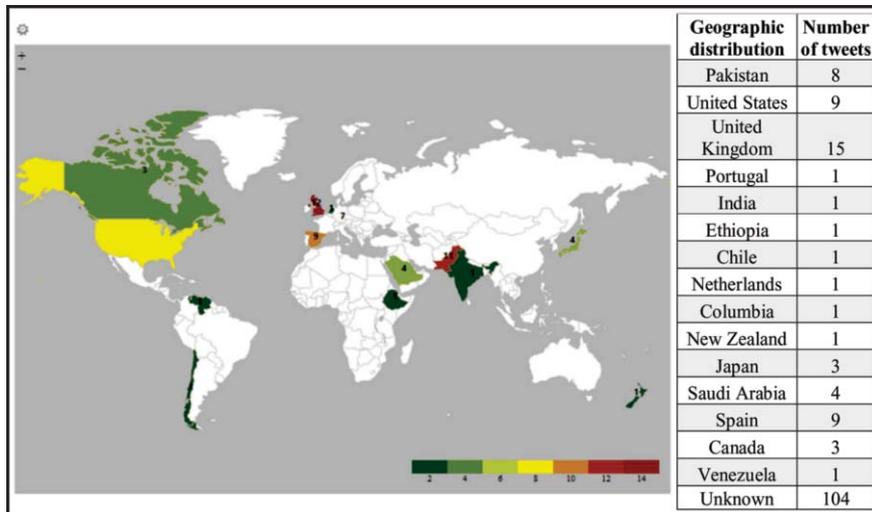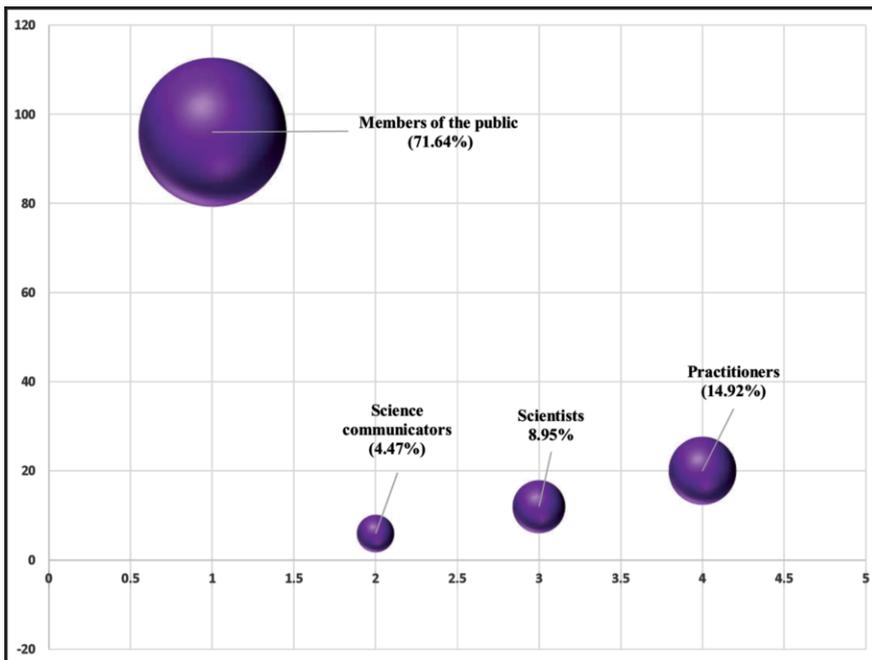
certain social media platform over another.[6]

The results were in line with a study which reported no significant correlation between CC and AAS.[6] For instance, of all the included studies, the top-cited publication had CC of 279, but the AAS for the same study was just 1.[8] Likewise, the study with the highest online attention had an AAS of 54 whereas CC for the same study was 91.[9]

The cumulative AAS for the publications in the current study was 158, wherein the greatest contribution was made by MFRK with an AAS of 106. Surprisingly, the major chunk to this score was contributed by a single study with AAS of 54.[9] This enhanced social engagement could be attributed to the presence of non-dental faculty members as co-authors, mentions, and re-tweets by different medical and dental organisations and journals as well as self-tweets.[7]

The pivotal finding of the current review is that coronavirus diseases-2019 (COVID-19) was among the hot topics, receiving the most online attention as well as citations. Another finding of significance is that among the 7 studies that were related to the pandemic, 6 were published by a single author, FUMR.[10-15]

According to the current study, Twitter was the most popular social media platform, followed by Facebook, which is in concordance with previous literature.[6,7] It is, however, perturbing to note that majority of the tweets were of unknown origin, making it difficult to infer the actual geographical spread of the included publications. Nevertheless, tweets had a diverse audience in almost all continents excluding Antarctica. The popularity was more in Europe (15.95%), followed by Asia (9.81%) and North America (7.36%). Although previous studies did report the actual geographical spread of tweets, they failed to communicate any demographic spread of the included publications.[6,7] In contrast, the current study revealed that tweets were found to be more trending among the members of the general public (71.64%), followed by an almost even distribution among dental and medical practitioners, scientists and science communicators.

Although altmetrics measure the real-time social impact of the publications, it has certain infirmities. It is a dynamic process that is expected to fluctuate over time. This contrasts with the traditional citation-based metrics and could be attributed either to the inactivation of an individual's social media account or the possibility of tweets or Facebook posts being deleted by the account holder. Likewise, there are concerns regarding self-tweets as is the case with self-citations. Moreover, in case of

tweets, although the demographic data is available on the Explorer, the information could still be misleading because it imports the data directly from the individual's profile and we do not know whether the members of the general public actually represent the said population. The same is the case with geographical data, as observed in the study, most of the tweets were from unknown geographical locations.

In terms of limitations, the current study had access to only a single database, the Altmetric Explorer. The results may have been different if we had access to other databases, like Plum Analytics. This is because certain journals subscribe to Altmetric Explorer whereas others register with Plum Analytics. Moreover, from all the publications by the faculty in the past decade, only a small proportion (15%) was included in the present analysis, thus making it difficult to infer the actual social impact of the publications. Furthermore, although the current study was able to conclude that Twitter was the most popular platform, it failed to differentiate among positive, negative and neutral tweets which otherwise would have eliminated the probability of self-tweets.

Despite the limitations, however, the current study is the first of its kind done in our part of the world. We plan to extend the current institution-based study to a multi-centre project having access to Plum Analytics database as well for a more accurate representation of the subject matter.

With the evolving trends in technology, a plethora of social media platforms addressing a diverse audience have been made available for researchers to communicate with a global network. Thus, a shift in focus is recommended for the researchers to pay similar attention to these alternative measures of impact as the traditional citation-based metrics. Furthermore, despite all the limitations, altmetrics should be given due attention when devising promotion and hiring strategies as is the case with CCs.

Conclusion

The publications by the Operative Dentistry fulltime faculty during the past decade had a modest social impact in the community in terms of AAS. Nevertheless, the publications had a diverse geographical as well as demographical spread, demonstrating wider outreach to the non-scientific community. This allows the dissemination of important research findings, thereby promoting the institution and the practitioner amongst those seeking dental care.

References

1. Khan FR, Ghafoor R, Umer F, Rahman M. Inculcating research curriculum in Operative Dentistry - Endodontics residency programme: Experience and outcomes. J Pak Med Assoc 2021;71(Suppl 1):s127-9.
2. Khan FR. Dental Research in Pakistan: Update 2020. J Pak Dent Assoc 2020;29:52-3. DOI: 10.25301/JPDA.292.49
3. Brigham TJ. An introduction to altmetrics. Med Ref Serv Q 2014;33:438-47. doi: 10.1080/02763869.2014.957093.
4. Garcovich D, Zhou Wu A, Sanchez Sucar AM, Adobes Martin M. The online attention to orthodontic research: an Altmetric analysis of the orthodontic journals indexed in the journal citation reports from 2014 to 2018. Prog Orthod 2020;21:31. doi: 10.1186/s40510-020-00332-6.
5. Wu Q, Wolfram D. The influence of effects and phenomena on citations: A comparative analysis of four citation perspectives. Scientometrics 2011;89:245-58. doi: 10.1007/s11192-011-0456-0.
6. Kolahi J, Khazaei S, Iranmanesh P, Khademi A, Nekoofar MH, Dummer PMH. Altmetric analysis of the contemporary scientific literature in Endodontology. Int Endod J 2020;53:308-316. doi: 10.1111/iej.13226.
7. Kolahi J, Khazaei S. Altmetric analysis of contemporary dental literature. Br Dent J 2018;225:68-72. doi: 10.1038/sj.bdj.2018.521.
8. Tabassum S, Khan FR. Failure of endodontic treatment: The usual suspects. Eur J Dent 2016;10:144-7. doi: 10.4103/1305-7456.175682.
9. Yakoob MY, Salam RA, Khan FR, Bhutta ZA. Vitamin D supplementation for preventing infections in children under five years of age. Cochrane Database Syst Rev 2016;11:CD008824. doi: 10.1002/14651858.CD008824.pub2.
10. Umer F, Haji Z, Zafar K. Role of respirators in controlling the spread of novel coronavirus (COVID-19) amongst dental healthcare providers: a review. Int Endod J 2020; 53:1062-7. doi: 10.1111/iej.13313.
11. Umer F, Motiwala M. Dental services during the COVID-19 pandemic: A tertiary care hospital experience. Spec Care Dentist 2020;40:431-6. doi: 10.1111/scd.12510.
12. Umer F. Ancillary considerations for endodontic emergency treatment of Covid-19 positive patients. Spec Care Dentist 2020;40:395-6. doi: 10.1111/scd.12484.
13. Umer F, Arif A. Preprocedural Pool Testing Strategy for Dentistry during the COVID-19 Pandemic. JDR Clin Trans Res 2021;6:139-44. doi: 10.1177/2380084421989693.
14. Umer F, Devi K, Jamal S. PPE: a coin with two sides. Br Dent J 2020;229:210. doi: 10.1038/s41415-020-2078-5.
15. Umer F. Successfully protecting staff. Br Dent J 2020;228:811. doi: 10.1038/s41415-020-1727-z.