

## Does research group enhance impact on scientific community or general public discussion: an alternative metric based evaluation

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### Abstract

#### Introduction:

The main goal of Altmetrics consists in supporting the existing indicators, by the impact of publications, expressed as level of downloading, reading, and discussion, in research and public communities. Altmetrics could become a valid assessment for the impact publication evaluation.

**Objectives:** We investigated Impact of scientific publications of the Italian SIMPAR (Study In Multidisciplinary Pain Research) group by Altmetrics, to correlate traditional and alternative metrics and to verify if publications by the Italian SIMPAR group have more impact (measured both by traditional or alternative metrics) than publication by a single member of the group.

#### Methods:

For all of 12 researchers of the team we created an ORCID (Open Researcher and Contributor ID) and an Impact Story account importing the data with the synchronization with the ORCID unique identifier. We downloaded from Impact Story the csv. file with all Altmetrics data for every account. Manually we indicated the article level metrics (if an article is cited, discussed, viewed) by dividing data between research and public communities. By Scopus we retrieved citations by articles of each researchers.

### Results:

We analyzed 169 articles, 18 of which were published by the SIMPAR group. Median number of articles by the authors was 17 (IQR 10-27); the median year of publication was 2013 (IQR 2011-2014). Altmetrics demonstrated that SIMPAR group publications were more likely to be saved (78% vs 53%,  $p=0.05$ ) and publically discussed (61% vs 4%  $p<0.0001$ ) than those published by individual member. However, no significant difference emerged between the SIMPAR group publications and single-member articles in terms of being cited (cited 44% vs 36%, highly cited 22 vs 11%,  $p=0.20$ ) and publically-viewed (11% vs 3%,  $p=0.25$ ). Notably, 11 articles out of 18 published collectively by the SIMPAR group received a tweet (median number 1, IQR 1-3), versus only 36 of 169 single-member articles.

Moreover, 15 articles from the SIMPAR group collectively were accessed through Mendeley Readers (median number of accesses 4, IQR 1-11) versus 85 by single author (median number of accesses 2, IQR 0-8;  $p=0.01$ ). We describe the correlation between Scopus citations and the single components of the analyzed alternative metrics. We found that the alternative metrics were generally low, with the exception of those for Mendeley Readers (Pearson  $r=0.47$ ,  $p<0.0001$ ).

### Discussion:

Although correlations are good only with an indicator linked to research activity, not to public discussion as Facebook likes or Tweets, the impact of SIMPAR articles is great also on general public items

This result support the importance of multidisciplinary research groups in the scientific literature; the interaction and synergy among the research participants allow the obtainment of high impact-literature in the field of personalized pain medicine.

### Conclusion:

Altmetrics confirms their utility in evaluating research impact in each dimension.

*Key words :Altmetrics, Bibliometrics, Pain Management, Multidisciplinary Pain Centers, Unique Identifier, Communications Media*

### Introduction

In this study, we investigated the impact of scientific publications of the Italian SIMPAR group (Study in Multidisciplinary PAin Research) by using Altmetrics, defined as non-traditional metrics constituting an alternative to more traditional citation impact metrics, such as impact factor and h-index.<sup>1</sup> By correlating traditional and alternative metrics, we attempted to verify whether publications by the SIMPAR group collectively had more impact than those performed by the its individual members.

Altmetrics creates a new approach to evaluating the impact of publications by considering the number of downloads, shares and discussions on social networks.

This approach does not replace the traditional bibliometric indicators, such as Impact Factor and H-index, but rather focuses on new aspects of publication impact<sup>1</sup>.

To use this new tool, we have focused on the Italian researchers of the SIMPAR group, which was founded in Pavia in 2007. This group has rapidly become an eminent translational group in the pain field, with its annual meeting now considered a major international pain conference ([www.simpar.eu](http://www.simpar.eu))<sup>2</sup>

SIMPAR's multidisciplinary collaboration has included physicians, psychologists, geneticists, pharmacologists, biologists, bioethicists, and statisticians, and has produced a number of publications regarding the personalization of pain therapy and identifying the most effective and safest therapies involving a combination of traditional medical, genetic, epigenetic, and OMIC disciplines

## Methods

For each of the 12 researchers of which SIMPAR team is comprised, we created an ORCID (Open Researcher and Contributor ID) account ([www.orcid.org](http://www.orcid.org)), in addition to an Impact Story (<https://impactstory.org>) account that imported our data and synchronized it with the unique ORCID identifiers.

These new metrics in Impact Story were classified along two dimensions: audience (scholars or the public) and type of engagement with the online research products (viewed, discussed, saved, cited). Additionally, by using Scopus, we retrieved the exact number citations of the articles published by each researcher

## Results

We analyzed 169 articles, 18 of which were published by the SIMPAR group. Altmetrics demonstrated that SIMPAR group publications were more likely to be saved (77.8% vs 45.9%), discussed (61.1% vs 1.1%,  $p < 0.0001$ ), and publically viewed (11.1% vs 1.3%,  $p = 0.05$ ) than were individual publications. Moreover, 15 articles from the SIMPAR group collectively were accessed through Mendeley Readers (median number of accesses 4, IQR 1-11) versus 85 of the individual publications (median number of accesses 2, IQR 0-8;  $p = 0.01$ ). We describe the correlation between Scopus citations and the single components of the analyzed alternative metrics in Table 1

**Table 1- Correlation coefficient (p-value) between Scopus citations and Altmetrics components**

	Facebook post	Tweets	Impact Story views	Mendeley Readers
Tweets	0.02 (0.81)			
Impact Story views	-0.01 (0.87)	0.13 (0.09)		
Mendeley Readers	-0.04 (0.60)	0.01 (0.87)	0 (0.93)	
Scopus citation	-0.05 (0.53)	-0.10 (0.18)	-0.04 (0.57)	0.47 (<0.001)

We found that the alternative metrics were generally low, with the exception of those for Mendeley Readers (Pearson  $r = 0.47$ ,  $p < 0.0001$ )

## Conclusion

We found significant correlations between the SIMPAR group collective publications and their impact on the indicator linked to research activity (Mendeley readers), although not to public discussion (such as Facebook and tweets).

Our results also illustrate how collaborative multidisciplinary teams and their projects improve the overall impact of researchers' work on the researchers themselves. However, the impact of SIMPAR group articles resulted high also on general public items, even though it did not reach the statistical significance.

Through these avenues, researchers can leverage social media opportunities to their own professional and academic advantage.

Furthermore, they can share ideas and research among our respective networks to elevate the community and spotlight pain studies both nationally and internationally 1

Finally, Altmetrics can help authors connect with the academic community over shared interest in a field of expertise, improve discoverability, and increase article citations.

## REFERENCES

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