

## An assessment of the impact and visibility of Saudi Arabia Journals

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### Abstract

*This research thrived to assess to Saudi Arabia research journals as per quality bibliometric indicators and scientometrics tools. Designated research assessment means are likely to underline comparisons between indicators significance and rates. Equally, the research work illustrated performance of well cited journals and portrayed sort of informational correlations among chosen indicators. Complex algorithms and reputable databases were used in assessing journals quality ranking. The key objective of the research undertaken is to review currently employed (2015) scientific journal quality indices with stress on the broadly employed indicators: Journal Impact Factor (JIF), Eigenfactor Score (ES), SCImago Journal Rank indicator (SJR) and H5-index. Particular Saudi Arabia research journals were picked from their category within Web of Science. JIFs and ESs are obtained from Journal Citation Report and the SJR from the SCImago Journal and country rank website. The ten (10) chosen Saudi Arabia research journals were noted and their related data and information reclaimed from their primary sites in linking associated JIF, SJR, ES and H5 quality indicators for ranking and refereeing their quality. Correlations between indicators were represented by means of Pearson's and Spearman's statistical correlations, calculated using SPSS software. All retrieved journals are indexed in Web of Science (WoS) and Scopus. Inspected JIFs fluctuated between 3.613 and 0.311; ES ranged between 0.00396 and 0.00052, while JSR extended between 0.552 and 0.24 and H5 varied between 29 and 20. Bivariate correlation between the four indicators (JIF, ES, SJR and H5) for ranking of the selected Saudi Arabia research journals revealed a high Pearson's ( $r$ ) statistical correlation between JIF and SJR indicators ( $r = 0.607$ ) and a rather low statistical correlation between JIF and H5 indicators for journals in the selected category ( $r = 0.522$ ). This correlation is lowest between JIF and ES values ( $r = 0.461$ ). With respect to Spearman's rho statistical correlation, a high correlation was observed between JIF and each of H5 and SJR indicators for Saudi Arabia research journals (coefficient values of 0.821 and 0.782, respectively), while a low correlation was recorded between JIF and ES rankings (coefficient value = 0.556).*

**Keywords:** *Journal rank, bibliometric indicators, Impact factor, SCImago indicator, Eigenfactor score, H5-Index, Saudi Arabia research journals*

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## Introduction

Publishing research findings, materials used, results and conclusions in scientific gatherings; academic venues; media and researcher settings contributes to accredited outcomes, citation associations and research work recognition.

Scientific research evaluation is of benefit to numerous sectors pursuing reputed journals for publication such as: research experts, professional societies, particular corps, discrete scientists and academics, higher education institutions and entities, librarians, writers, and authors (Nagaraja & Vasanthakumar 2011, Al-Khalifa 2014 and Ahmed et al. 2016).

Quality standards of research and scientific journals usually are gauged through firm scientometric tools and instruments. Such bibliometric indicators and means have their advantages and drawbacks. Most widely used bibliometric and scientometric indicators include: Journal Impact Factor or Eugene Garfield factor (JIF), Eigenfactor Score (ES), SCImago Journal Rank indicator, and H5 indicator (see Fig. 1). A number of factors influence the number of citations of a journal, such as journal history and its indexing in an accredited database, rate of international cooperation, and country of publication (Hussain & Swain 2011, Jamali et al. 2014).

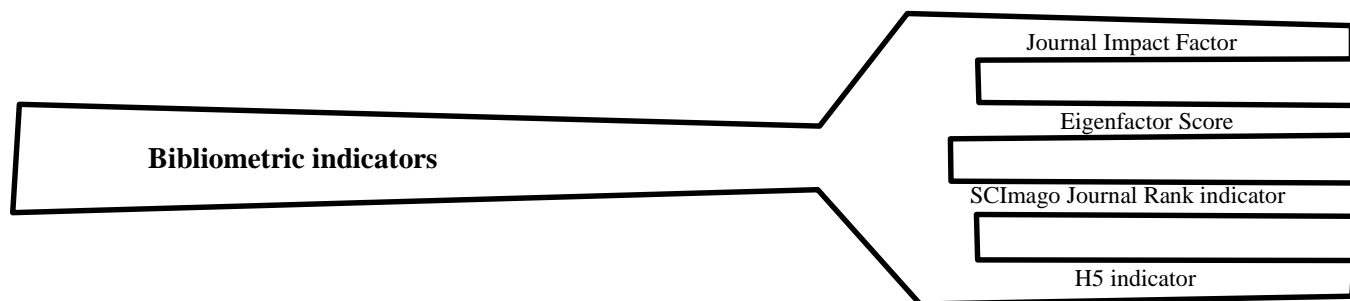


Fig. (1): Bibliometric indicators fork.

JIF is the most widely used indicator from the authors' experience and work. JIF is calculated annually by dividing the number of citations to articles published in the journal in the past two years, by the number of articles published in the journal in the same time frame (Garfield 2006). Nonetheless, JIF has been criticized for its English-language bias and influence of self-citation (Ramin & Sarraf 2012).

SJR indicator is founded on an algorithm similar to Google's PageRank. Citations are based on the Scopus database, covering a window of 3 years. SJR takes into account journal prestige and status, which gives more weight to citations for highly ranked journals (SCImago 2007).

ES gives more weight to citations from highly ranked journals. Algorithm used in its computation is akin to Google's PageRank (Ramin & Sarraf, 2012). Citations are based on the WoS database, covering a window of 5 years. ES is announced on the Eigenfactor project's website where they can be accessed and viewed (Kim and Hong, 2016).

Google Scholar took invented the H-5 index for ranking publications. A journal with an index of h has published at least h articles, each of which has been cited h times in other articles, for the period of the last five years (Google Scholar, 2016).

## Research objective

In this research analysis, the quality metrics of selected Saudi Arabia research journals were associated to establish their database coverage in Scopus and WoS and to compare related bibliometric factors, show their discrepancies, and draw some suggestions for practice as guided by the JIF, ES, SJR and H5 index indicators.

## Materials and methods

Ten (10) selected Saudi Arabia research journals were inspected in this study. Appropriate information and desired data were gathered from their sources and sites as curtailed within the journal ranking section of SCImago journal and country ranking website<sup>2</sup> and from Web of Science<sup>3</sup> (WoS) Core Collection official website and citations, ISI<sup>4</sup>- and Scopus-indexed journals. Collected information permitted calculating selected journal indicators. The 2015 JIFs and ESs were obtained from Journal Citation Report® (JCR) through WoS. The 2015 SJR and h-index indicators were withdrawn by the SCImago Journal, and country rank provided by Scopus and Google Scholar Citations (GS) metrics under the category of “Saudi Arabia research journals”.

The correlations between obtained indicators were evaluated using Pearson’s and Pearson’s’ correlation coefficients using Statistical Package for the Social Sciences (SPSS) version 21.0, 2012 release.

## Results and discussion

Number of Saudi Arabia research journals within prestigious ranking websites is rather limited. Search results predicted ten (10) reputable journals in fields of: engineering education, medicine and medical practices, pharmaceutical learning industry and science (biology, chemistry and mathematics) studies. Ranking of the Saudi Arabia research journals conformed to all four indices (IF, ES, SJR and H5). Correlations between indices were evaluated using Pearson and Spearman correlations, calculated using SPSS 21.0. In general, the ten (10) journals were arranged and indexed in both ISI and Scopus, with rankings as per SCImago, JIF, ES and H5 in 2015. Table (1) shows detailed information and ISI- and Scopus-indexed information for the chosen Saudi Arabia research journals.

Table (1) obviously demonstrates that very few of the selected Saudi Arabia research journals had the same ranking across the selected four (4) indices. As such, it is difficult to relate metrics across the distinctive indicators.

**Table (1): Comparative rankings of Saudi Arabia journals by 2015 JIF, ES, SJR and H5 Index**

Journal Title	Journal Impact Factor		Eigenfactor Score		SCImago Journal Rank		H5-Index	
	JIF	JIF_Rank	ES	ES_Rank	SJR	SJR_Rank	H5	H5_Rank
Arabian Journal of Chemistry	3.613	1	0.00396	1	0.512	3	29	1

<sup>2</sup> Website: <http://www.scimagojr.com/>.

<sup>3</sup> Website: <http://www.accesowok.fecyt.es/>.

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Saudi Pharmaceutical Journal	2.233	2	0.00131	8	0.552	1	23	3
Journal of Saudi Chemical Society	1.978	3	0.00192	4	0.385	5	24	2
Saudi Journal of Biological Sciences	1.781	4	0.00149	6	0.515	2	22	5
Saudi Journal of Gastroenterology	1.312	5	0.00136	7	0.41	4	23	3
Bulletin of Mathematical Sciences	1.194	6	0.00109	9	N/A	10	N/A	9
Arabian Journal for Science and Engineering	0.728	7	0.00317	2	0.345	6	20	6
Saudi Medical Journal	0.562	8	0.00235	3	0.276	8	20	6
Neurosciences	0.541	9	0.00052	10	0.299	7	N/A	9
Annals of Saudi Medicine	0.311	10	0.00171	5	0.24	9	20	6

As related to JIF, the most cited top three of Saudi Arabia research journals were (JIF score in parenthesis): Arabian Journal of Chemistry (3.613), Saudi Pharmaceutical Journal (2.233) and Journal of Saudi Chemical Society (1.978). These journals were closely followed by Saudi Journal of Biological Sciences (1.781). In contrast, the lowest citations were scored by Annals of Saudi Medicine (0.311).

In terms of Eigenfactor Score, the three journals that classed top were (ES score in parenthesis): Arabian Journal of Chemistry (0.00396), Arabian Journal for Science and Engineering (0.00317) and Saudi Medical Journal (0.00235). Neurosciences scored the lowest ES score (0.00052) noted for the journals picked for this research work.

Ranking of top three journals as assessed by SJR (SJR score in parenthesis) are: Saudi Pharmaceutical Journal (0.552), Saudi Journal of Biological Sciences (0.515) and Arabian Journal of Chemistry (0.512). Annals of Saudi Medicine tailed the record of evaluated journals, with SJR scores of 0.24.

H-5 Index incidentally coincided with JIF for ranking its top three journals particularly (H-5 index in parenthesis): Arabian Journal of Chemistry (29), Journal of Saudi Chemical Society (24) and Saudi Pharmaceutical Journal and Saudi Journal of Gastroenterology (23). These were followed very closely by Saudi Journal of Biological Sciences (22). The trail of journals followed yet a closer score as is shared by Arabian Journal for Science and Engineering, Saudi Medical Journal and Annals of Saudi Medicine (20).

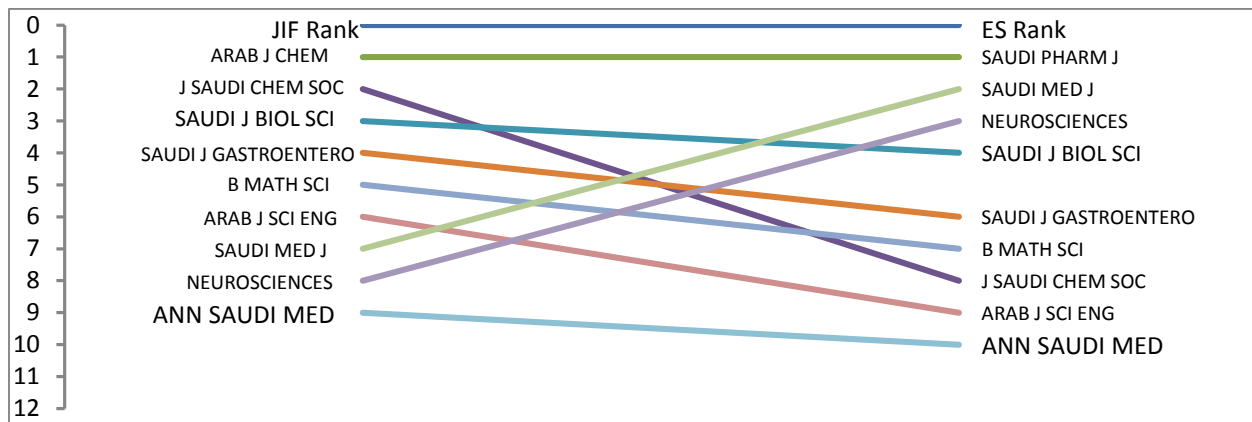
Table (2) shows a bivariate correlation between the four indicators (JIF, ES, SJR and H5) for ranking of the selected Saudi Arabia research journals. As revealed in the table, there is a high Pearson's (r) statistical correlation between JIF and SJR indicators ( $r = 0.607$ ) and a rather low statistical correlation between JIF and H5 indicators for journals in the selected category ( $r = 0.522$ ). This correlation is lowest between JIF and ES values ( $r = 0.461$ ).

With respect to Spearman's rho statistical correlation, a high correlation was observed between JIF and each of H5 and SJR indicators for Saudi Arabia research journals (coefficient values of 0.821 and 0.782, respectively), while a low correlation was recorded between JIF and ES rankings (coefficient value = 0.556).

**Table (2): Bivariate correlation between three indicators for ranking of Saudi Arabia journals**

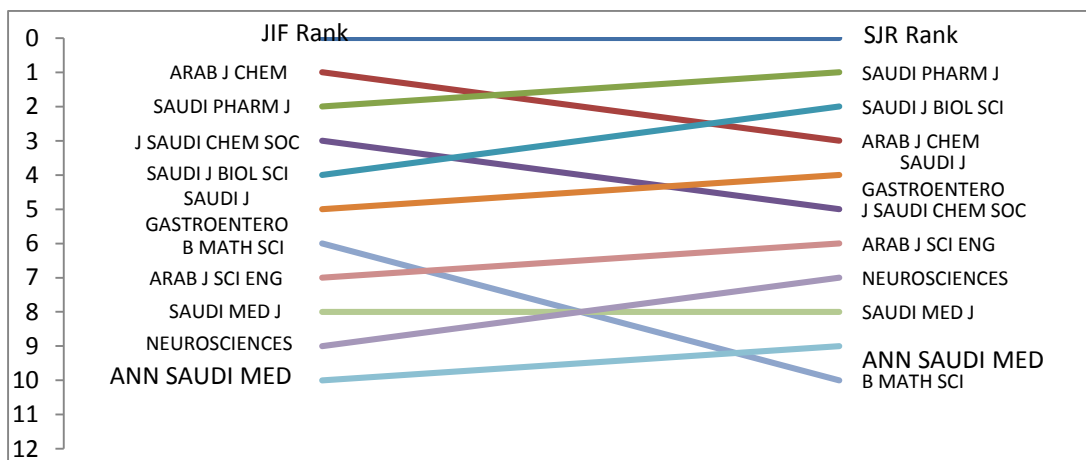
Correlation statistic	Coefficient value	Sig.
Pearson's r between JIF and ES values	0.461	.000
Pearson's r between JIF and SJR values	0.607	.000
Pearson's r between JIF and H5 values	0.522	.000
Spearman's rho between JIF and ES rankings	0.556	.000
Spearman's rho between JIF and SJR rankings	0.782	.000
Spearman's rho between JIF and H5 rankings	0.821	.000

Figure (1) represents a bump chart for the top ten (10) JIF-ranked Saudi Arabia research journals in comparison with their respective ES ranking. Fig. (1) clearly depicts the changing array of ranking of both indicators for the selected journals.



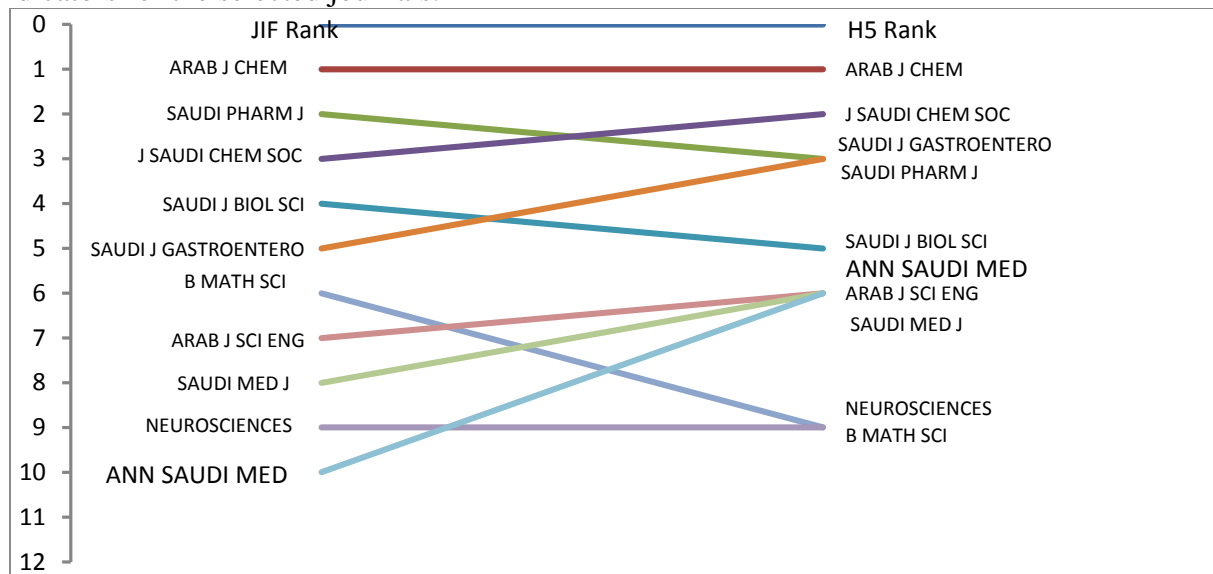
**Fig. (1): Bump chart for top 10 JIF ranked Saudi Arabia journals in comparison with ES ranking.**

Fig. (2) represents a bump chart for the top ten (10) JIF-ranked Saudi Arabia research journals in comparison with their respective SJR ranking. Fig. (2) evidently describes the varying assortment of ranking of both indicators for the designated journals.



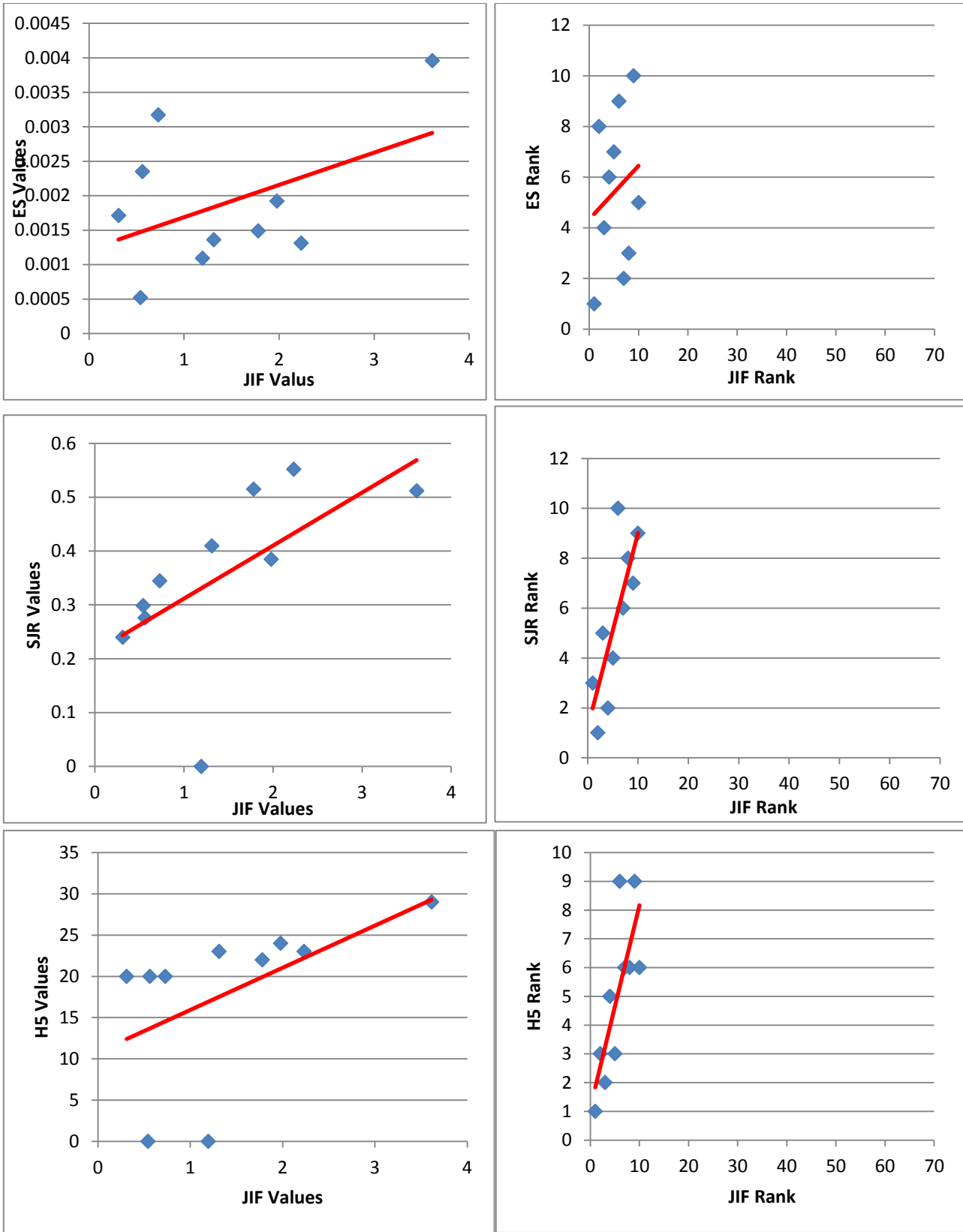
**Fig. (2): Bump chart for top 10 JIF ranked Saudi Arabia journals in comparison with SJR ranking.**

Fig. (3) represents a bump chart for the top ten (10) JIF-ranked Saudi Arabia research journals in comparison with their respective H5 ranking. Fig. (2) plainly defines the wavering assortment of ranking of both indicators for the selected journals.



**Fig. (3): Bump chart for top 10 JIF ranked Saudi Arabia journals in comparison with H5 ranking.**

Figure (4) illustrates six-scatter plots presentation the correlation between JIF, ES, SJR and H5 (values and rankings) as well as their fit lines for the ten (10) Saudi Arabia research journals incorporated in this study. Figures (4-a) and (4-b) displays a linear correlation between the values and ranks of JIF and ES indicators. Figures (4-c) and (4-d) shows a stronger relationship between the values and ranks of JIF and SJR indices. Figures (4-e) and (4-f) exhibits the same correlation between the values and ranks of JIF and H5. A linear correlation between the different values of indices (ES versus JIF, and SJR versus JIF) is visibly exposed in the figures. Similarly, linearity of relationship is apparent between ranks of ES versus JIF, SJR versus JIF and H5 versus JIF.



**Fig. (4):** Scatter plots showing correlation between JIF, ES and SJR (values and rankings) as well as their fit lines for 82 Saudi Arabia journals.



Assembled research statistical data and information revealed that sole use of the SJR index does not really adjust the system sorting of Saudi Arabia research journals as compared to the JIF or its technique of calculation. Since SCImago Journal and Country Rank is a free access source, this suggests that SJR may be embraced as an alternative, or in addition, to the JIF for Saudi Arabia research journals. Likewise, the H5 metric would be a reliable tool for quality evaluation of Saudi Arabia research journals.

The four indicators (JIF, ES, SJR and H5) ought to be employed in an integrated fashion to offer a more holistic and all-inclusive view of journal quality assessment. This finding is in agreement with Ahmad et al. (2016a and 2016b).

## Conclusions

In this research work four bibliometric research quality indices (JIF, SJR, ES and H5) were examined and assessed for certain Saudi Arabia research journals. The following conclusions materialized:

- ✓ Journal Impact Factor (JIF) is the major indicator exercised by investigators and academics for ranking Saudi Arabia research journals, periodicals, bulletins and publications.
- ✓ All of JIF, SJR, ES and H5 indicators are recommended for quality assessment for Saudi Arabia research journals.
- ✓ Bivariate correlation between the four indicators (JIF, ES, SJR and H5) for ranking of the selected Saudi Arabia research journals revealed a high Pearson's ( $r$ ) statistical correlation between JIF and SJR indicators ( $r = 0.607$ ) and a rather low statistical correlation between JIF and H5 indicators for journals in the selected category ( $r = 0.522$ ). This correlation is lowest between JIF and ES values ( $r = 0.461$ ).
- ✓ With respect to Spearman's rho statistical correlation, a high correlation was observed between JIF and each of H5 and SJR indicators for Saudi Arabia research journals (coefficient values of 0.821 and 0.782, respectively), while a low correlation was recorded between JIF and ES rankings (coefficient value = 0.556).

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