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A scientific influence and reflectivity of Saudi Arabia research journals

By

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Abstract

This research has continued to evaluate Saudi Arabia's journals by quality bibliometric indicators and scientific tools and is likely to highlight comparisons between the significance and the rates of indicators. The research has also illustrated the achievements and the information correlated between the selected indicators of well-cited journals and used sophisticated algorithms and reputable databases to evaluate journals' quality rankings.

The research aims primarily to review the scientific journal quality indices that are currently used (2015), with emphasis on the generally used indicators, such as the Journal impact factor (JIF), the Eigenfactor Score (ES), the SCImago Journal Rank Indicator (SJR) and the Google H-5 index. JIF and ES were obtained from the Journal Citation Report and the SJR from SCImago Journal and country-ranked websites. Special Saudi Arabia research journals are selected from their category from Web Science.

The ten (10) chosen Saudi Arabia research journals were noted, and their related data and information reclaimed from their primary websites in linking associated Journal impact factor, SJR, ES and Google H-5 quality indicators for ranking and refereeing their quality. Correlations between indicators were represented employing Pearson's and Spearman's statistical correlations, calculated using SPSS software. All retrieved journals are indexed in Web of Science (WoS), Scopus, and Google Scholar Metrics. Examined JIFs fluctuated between 3.613 and 0.311; ES ranged between 0.00396 and 0.00052, while JSR extended between 0.552, 0.24, and Google H-5 varied between 29 and 20.

A high Pearson (r) statistical correlation between the JIF and SJR indicators ($r = 0.607$), as well as a rather low statistical relation between JIF and Google H-5 index for the category in which journals were selected ($r = 0.522$, is apparent from the bivariate correlation between the JIF, ES, SJR, and Google H-5 index indicators for selected journals. This is the lowest correlation of JIF with ES values ($r = 0.461$).

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Concerning Spearman's rho statistical correlation, a high correlation was observed between JIF and each of Google H-5 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, Google H-5 Index, Saudi Arabia research journals

1) 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).

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 Google H-5 indicator (see Fig. 1). Several factors influence the number of citations of a journal, such as a journal history and its indexing in an accredited database, rate of international cooperation, and country of publication (Hussain & Swain 2011; Jamali et al. 2014).

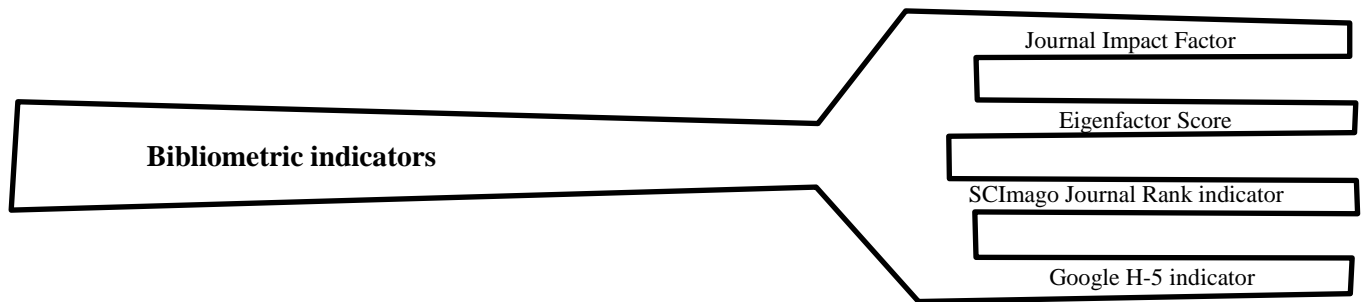


Fig. (1): Bibliometric indicators fork.

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 period (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. An 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).

2) Research objective

In this research analysis, the quality metrics of selected Saudi Arabian journals were associated with establishing their database coverage in Scopus and Web of Science and with comparing related bibliometric factors, show their discrepancies, and draw some suggestions for practice as guided by the JIF, ES, SJR and Google H-5 index indicators.

3) 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 website² and from Web of Science³ (WoS) Core Collection official website and citations, ISI⁴- 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 SCImago Journal withdrew the 2015 SJR and Google H-5 index indicators, 8

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 the Statistical Package for the Social Sciences (SPSS) version 21.0, 2012 release.

4) Results and discussion

The number of Saudi Arabia research journals within prestigious ranking websites is somewhat limited. Search results predicted ten (10) reputable journals in the 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 Google H-5). 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

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

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

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Google H-5 in 2015. Table (1) shows detailed information and ISI- and Scopus-indexed information for the chosen Saudi Arabia research journals.

Table (1) 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 distinctive indicators.

Table (1): Comparative rankings of Saudi Arabia research journals by 2015 JIF, ES, SJR and Google H-5

Journal Title	Journal Impact Factor		Eigenfactor Score		SCImago Journal Rank		Google H-5	
	JIF	JIF_Rank	ES	ES_Rank	SJR	SJR_Rank	H-5	H-5_Rank
Arabian Journal of Chemistry	3.613	1	0.00396	1	0.512	3	29	1
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). Saudi Journal of Biological Sciences (1.781) closely followed these journals. In contrast, Annals of Saudi Medicine (0.311) scored the lowest citations.

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.

Google 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), Saudi Pharmaceutical Journal, and Saudi Journal of Gastroenterology (23). Saudi Journal of Biological Sciences (22) followed these very closely. 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), for selected research journals in Saudi Arabia, shows a bivariate correlation between the four indicators (JIF, ES, SJR and Google H-5). As shown in the table, there is a high statistical correlation of Pearson (r) between JIF and SJR indicators ($r= 0.607$) and a relatively low statistical correlation between JIF and Google H-5 indicators for selected category journals ($r= 0.522$). The correlation between JIF and ES ($r=0.461$) is lowest.

Concerning Spearman’s rho statistical correlation, a high correlation was observed between JIF and each of Google H-5 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 research 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 Google H-5 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 Google H-5 rankings	0.821	.000

Fig. (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) depicts the changing array of ranking of both indicators for the selected journals.

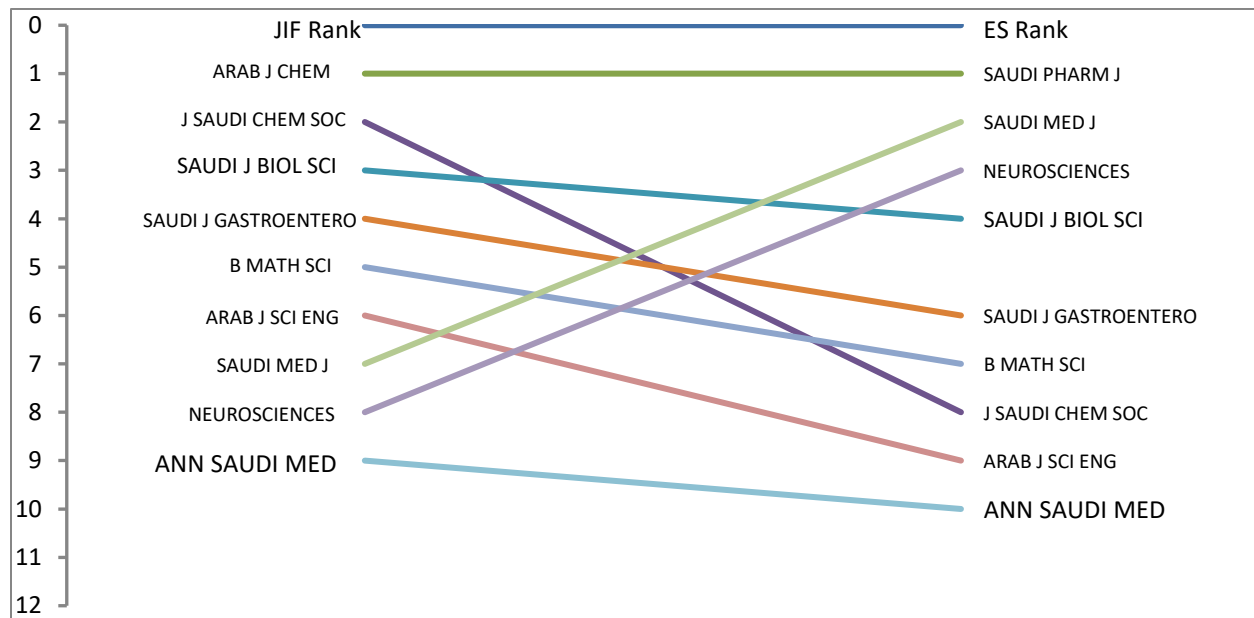


Fig. (1): Bump chart for top 10 JIF ranked Saudi Arabia research journals in comparison with ES ranking.

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) Describes the result of varying assortment of ranking of both indicators for the designated journals.

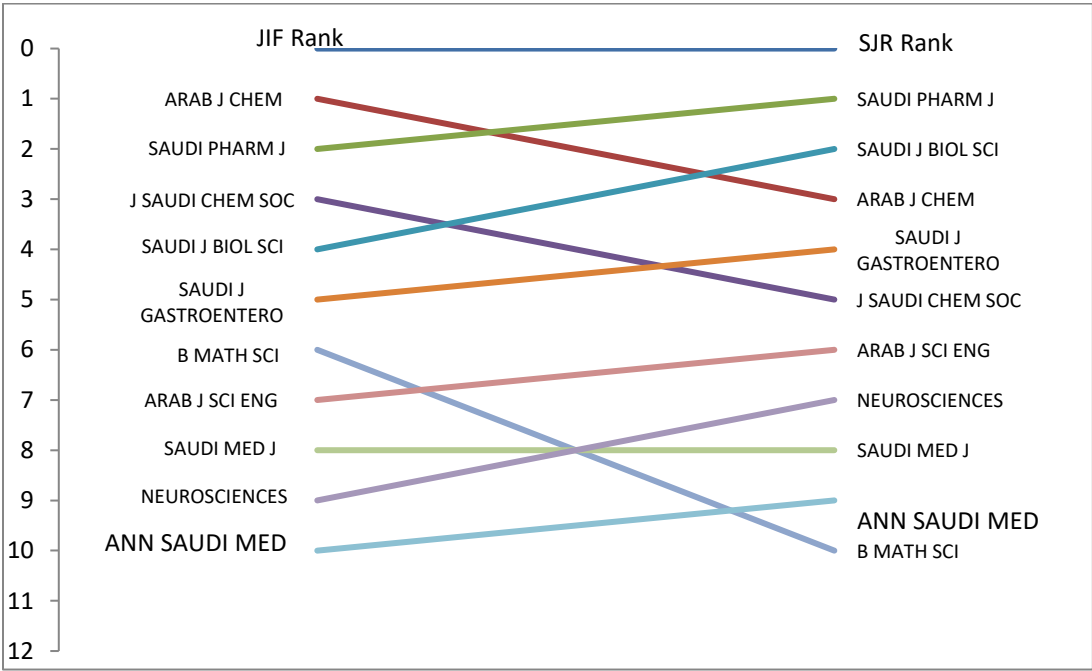


Fig. (2): Bump chart for top 10 JIF ranked Saudi Arabia research journals in comparison with SJR ranking.

Fig. (3) Represents a bump chart for the top ten (10) JIF-ranked Saudi Arabia research journals in comparison with their respective Google H-5 ranking. Fig. (2) Plainly defines the wavering assortment of ranking of both indicators for the selected journals.

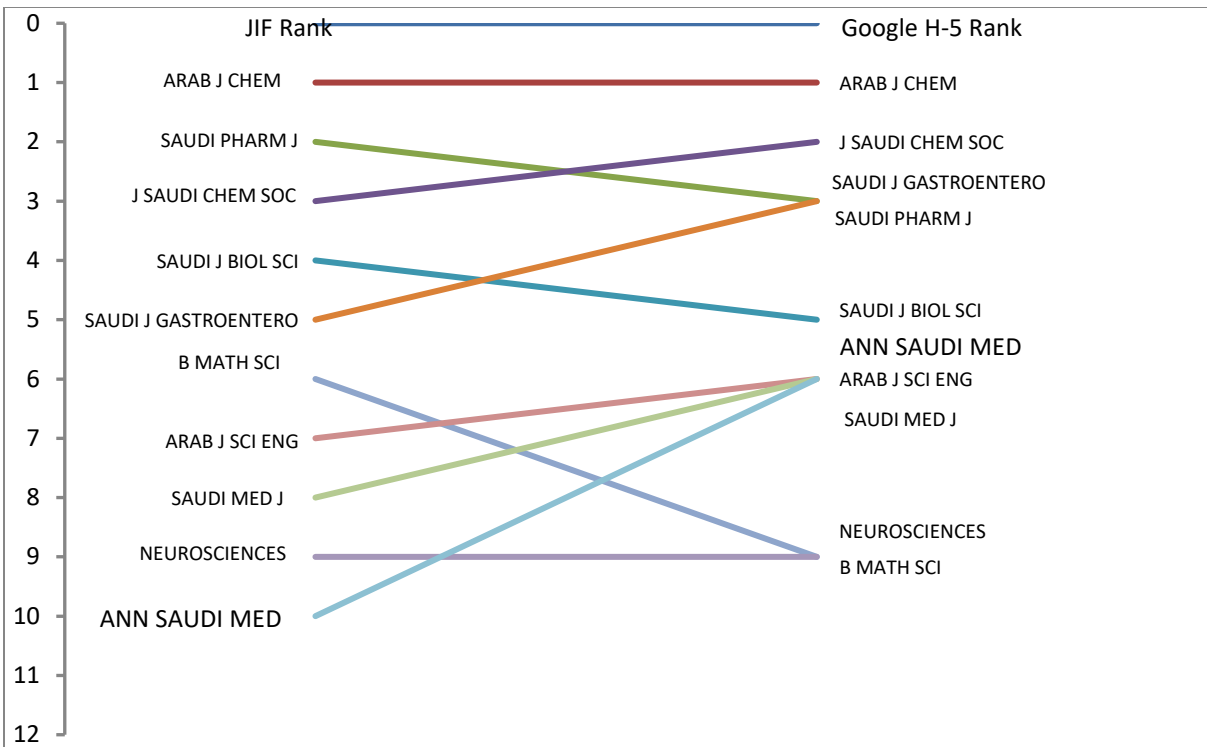


Fig. (3): Bump chart for top 10 JIF ranked Saudi Arabia research journals in comparison with Google H-5 ranking.

Figure (4) illustrates six-scatter plots presentation the correlation between JIF, ES, SJR and Google H-5 (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 Google H-5. A linear correlation between the different values of indices (ES versus JIF, and SJR versus JIF) is visibly exposed in the figures. Similarly, the linearity of relationship is apparent between ranks of ES versus JIF, SJR versus JIF and Google H-5 versus JIF.

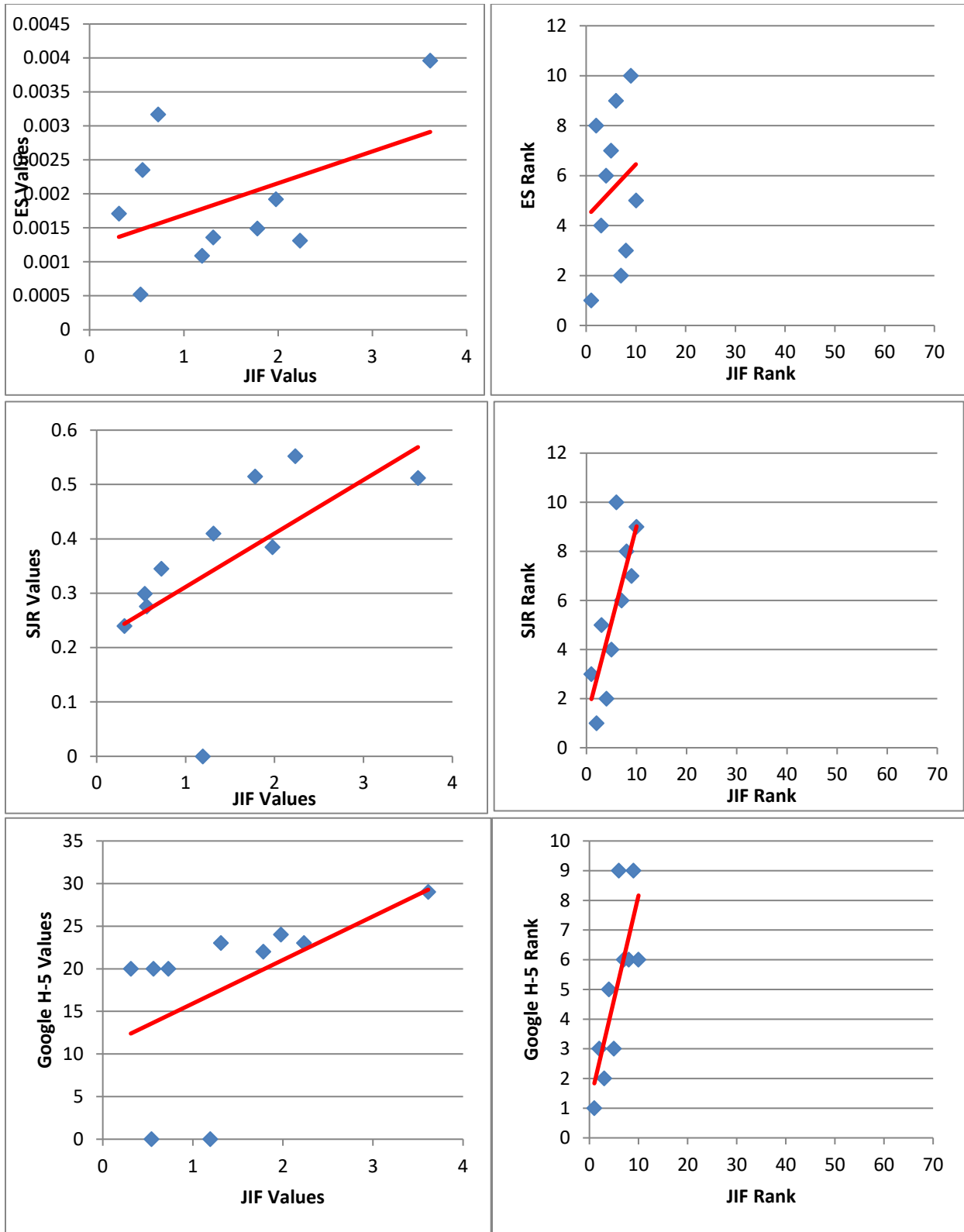


Fig. (4): Scatter plots showing the correlation between JIF, ES, SJR, and Google H-5 (values and rankings) as well as their fit lines for 10 Saudi Arabia research journals.

Assembled research statistical data and information revealed that sole use of the SJR index does not 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 also, to the JIF for Saudi Arabia research journals. Likewise, the Google H-5 metric would be a reliable tool for quality evaluation of Saudi Arabia research journals.

The four indicators (JIF, ES, SJR, and Google H-5) 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).

5) Conclusions

In this research work, four bibliometric research quality indices (JIF, SJR, ES and Google H-5) were examined and assessed for specific Saudi Arabia research journals. The following conclusions materialized:

- ✓ Journal Impact Factor (JIF) is the primary indicator exercised by investigators and academics for ranking Saudi Arabia research journals, periodicals, bulletins, and publications.
- ✓ All of JIF, SJR, ES and Google H-5 indicators are recommended for quality assessment for Saudi Arabia research journals.
- ✓ Bivariate correlation between the four indicators (JIF, ES, SJR and Google H-5) 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 Google H-5 indicators for journals in the selected category ($r = 0.522$). This correlation is lowest between JIF and ES values ($r = 0.461$).
- ✓ Concerning Spearman's rho statistical correlation, a high correlation was observed between JIF and each of Google H-5 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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