Analysis of Orthopedic Article Processing Charges in the United States

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INTRODUCTION: Peer-reviewed scientific journals utilize two publishing models: open (OA) or hybrid access (HA). OA publishes articles freely available, whereas HA allows authors to elect access type (restricted or open). With research costs increasing, article processing charges (APCs) are also drastically increasing. We sought to analyze any correlation between APC and engagement metrics (impact factor and H5-index) for both OA and HA models in orthopedic literature. We hypothesized that there would be no correlation between APC and engagement metrics, regardless of publication model.

METHODS: The Scimago Journal & Country Rank (SJR) database was queried, identifying 100 orthopedic and related journals. Thirty-six journals were excluded for scope beyond orthopedics, non-native to United States, discontinued as of 2023, or for invitation only. The included 64 journals consisted of 19 OA and 45 HA journals. Data collected included APCs, impact factors (IF), and H5-indexes. Correlation between APC and engagement metrics was determined using linear regression to obtain a coefficient of determination (R2). T-statistics were used to calculate variable significance. Statistical significance was determined at $P<.05$, and correlation was considered strong at $R2 \geq 0.80$. Nonsignificant data were tested with post-hoc power analysis.

RESULTS SECTION: On average, the APC for OA was $1,977 compared to HA $3,365 ($P<.0001$, Table 1). No significant differences between journal type and IF or H5-Index were observed. R2 for OA APC vs. IF and H5-index were 0.64 and 0.47, respectively ($P<.001$), whereas HA APC vs. IF and H5-Index were 0.42 and 0.39, respectively ($P<.001$). When comparing all included journals, the R2 for APC vs. IF is 0.33 (Figure 1).

DISCUSSION: OA requires smaller APCs compared to HA journals without significant differences in engagement metrics. Although no robust correlation was identified, the engagement metrics do have a statistically significant effect on the APC. Thus, with increasing APCs, OA remains a viable option for cost-effective publishing without sacrificing engagement metrics in orthopedics.

SIGNIFICANCE/CLINICAL RELEVANCE: Aggregating journal APC costs can better inform orthopedic researchers looking to maximize cost benefit.

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IMAGES AND TABLES:

Table 1. Descriptive Statistics Between Open and Hybrid Access Journals

	OA (n=19)	HA (n=45)	P value
APC (USD)	$1,976.95 ± 1044.88	$3,364.89 ± 666.70	**< .0001**
IF	2.16 ± 1.98	2.30 ± 1.54	.7617
H5-Index	25.95 ± 16.91	34.13 ± 20.12	.1253
Total Documents in 2023	156.11 ± 121.89	187.51 ± 147.81	.4181

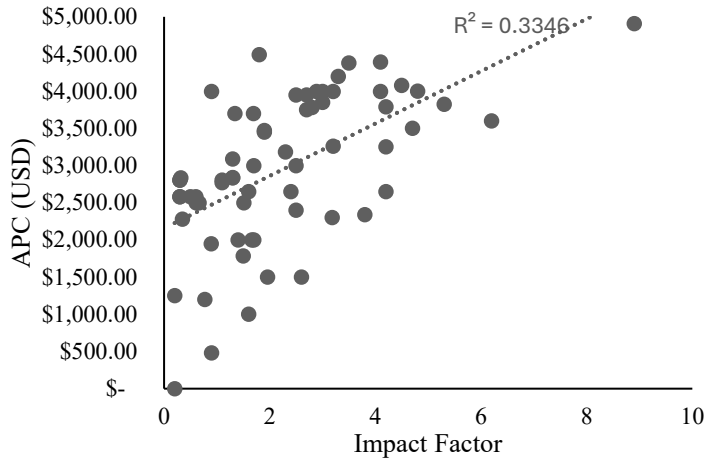

Figure 1. Linear Regression of APC by Impact Factor for All Included Journals.
Abbreviations: OA=open access, HA=hybrid access, USD=United States Dollar, IF=impact factor.