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Evaluation of Faculty Knowledge of Predatory Journals in the United States: A Cross-Institutional Survey

Nicole R. Webber[1] 🄳 | Stephanie Wiegand[1] 🄳 | Jason A. Cohen[2] 🄳 | John M. Reynolds[3] 🄳 | Lisa Ancelet[4] 🄳 | Arlene V. Salazar[4] 🄳

[1]University of Northern Colorado, Greeley, USA | [2]University of Miami Libraries, Coral Gables, USA | [3]University of Miami Miller School of Medicine, Louis Calder Memorial Library, Miami, USA | [4]Texas State University, San Marcos, USA

Correspondence: Jason A. Cohen (j.cohen4@miami.edu)

ABSTRACT

Predatory journals are a known hazard in modern academic research publishing, with research and anecdotal accounts indicating that they exploit inexperienced researchers. Most literature on the topic centres on specific disciplines and/or countries deemed 'more vulnerable' to publishing scams. At the time of publication, no studies have examined a full range of disciplines at institutions across the United States. Our research collected responses from 1098 faculty at 17 US doctoral universities using a multi-disciplinary survey to assess self-reported knowledge and awareness of predatory publishing. In this analysis, we investigated participants' reported knowledge levels of predatory journals in relation to four aspects: academic discipline, years employed in academic research, number of articles published, and early career researcher status. We conclude that the relationship between experience and knowledge of predatory publishing depends on the definition of experience employed, and that the number of recent articles published by a faculty member is a more reliable indicator of knowledge about predatory publishing than the other measures of experience investigated.

1 | Introduction

Over the past two decades, the academic community has witnessed a spectrum of potentially predatory behaviour exhibited by journal publishers. These behaviours range from intentionally unethical practices to innocent growing pains of nascent journals. Early evidentiary investigations into predatory publishing were secondary to editorials and commentaries advising authors on proper courses of action. Consequently, the empirical research in this area is only now beginning to expand into more objective methods for defining and understanding publishers, journals, and authors operating in the 'predatory' realm (Mertkan et al. 2021; Nagarkar and Khole 2023). These methodologies increasingly collect data directly from researchers concerning their knowledge of and experience with predatory journals rather than relying on subjective or enigmatic lists. Our research team, representing Texas State University (TXST), the University of Miami (UM), and the University of Northern

Colorado (UNC), sought to survey faculty of all disciplines employed at doctoral-granting institutions to further existing research and identify a benchmark for researchers in the United States.

While predatory publishing is known to be a global issue, there is ample justification for investigating the situation in the United States. The country is ranked highly in several studies of author and editor affiliation or journal location of presumed predatory outlets (Alrawadieh 2018; Boukacem-Zeghmouri et al. 2023; Demir 2018; Kurt 2018; Shen and Björk 2015; Wallace and Perri 2018). These results are tempered by the overall scholarly output and market share of research in the United States (Moher et al. 2017; Wallace and Perri 2018); yet a study of one US university found that during a five-year period, over $300,000 of its federal grant monies were paid to predatory publishers (Powell and Kupsco 2018), demonstrating that it can come at a substantial cost. By strengthening the overall understanding of predatory

Summary

- The number of recent articles that a faculty member has published was shown to be the strongest indicator of their level of knowledge about predatory journals.

- Whether a faculty member is an early career researcher was not shown to be an indicator of their level of knowledge about predatory journals.

- A faculty member's discipline alone does not indicate their knowledge level of predatory journals.

publishing, scholars and institutions will be less likely to contribute to deceptive outlets and protect legitimate publications from fraud.

1.1 | Knowledge of and Attitudes Toward Predatory Journals

Recent literature reports the amount of knowledge researchers have of predatory practices and their perceptions and experiences. Some studies attempt to test participants' knowledge while others measure their perceived knowledge and understanding. However, the limited scopes of previous studies of knowledge and attitudes toward predatory journals do not translate to a clear depiction of the situation either because they focus on a single discipline or on foreign or international settings. Missing from the literature are studies exploring researchers based in the United States that are both multidisciplinary and cross-institutional.

Out of concern for research quality within one's own discipline, and due to the relative ease of obtaining email lists, much of the research focuses on individual fields of study with a majority concentrated within the health sciences (Mertkan et al. 2021; Nagarkar and Khole 2023). Research focused outside of the United States may provide insight into distinct regions or countries, but it is difficult to properly generalise due to differing research cultures and requirements (Habiba and Ahmed 2024; Kharumnuid and Singh Deo 2024; Shehata and Elgllab 2018). Whether each study concentrated on a specific discipline, region, or both, there is growing consensus that scholars possess some level of knowledge regarding predatory publishing and acknowledge the importance of learning to avoid the pitfalls of predatory journals. Complicating this consensus is the acknowledgment that some scholars knowingly publish in predatory publications (Boukacem-Zeghmouri et al. 2023; Kurt 2018; Pyne 2017). Since authors may intentionally inflate their publication record with predatory publications, as discussed by Wallace and Perri (2018) and Alrawadieh (2018), researchers have begun to investigate attitudes toward predatory publishing to better understand the relationship between an author's motivations and intentions in addition to knowledge.

A limited number of studies investigated faculty knowledge of and attitudes toward predatory publishing at a multidisciplinary level within the United States. Swanberg et al. (2020) surveyed the knowledge and attitudes of 183 university faculty and medical school faculty at one US institution. They found that 86.9% of

respondents agreed or strongly agreed that they were confident in their ability to assess journal quality, but that only 60.0% of respondents correctly identified a journal as predatory when presented with its website. Additionally, although 70.5% of faculty reported they had heard of the term *predatory OA journal*, only 13.3% had received training on the subject. Similarly, Webber and Wiegand (2022) studied knowledge of predatory publishing across multiple disciplines at a single US university and found that the majority (57.8%) of the 109 participants reported being familiar with predatory journals. Formal training on the topic was also relatively rare for participants in this study, and only 67.0% agreed or strongly agreed that they would be able to recognise a predatory journal. The two studies agree in their conclusions that faculty claim to be aware of predatory publishing, but also that evidence suggests a gap between the perceived and actual knowledge.

1.2 | Author Experience

A scholar's professional experience is a potential explanatory factor for the knowledge level of, or participation in, predatory publishing. Anecdotally, scholars expected to find early career researchers (ECR) to be the primary population publishing in predatory journals, based on an assumption that these authors are unsuspecting victims of predatory publishers. Defining and measuring experience is challenging. To measure experience, researchers have employed disparate variables such as professional rank or position, various aspects of time, and record of publication. The differing variables complicate the ability to make definitive conclusions; nevertheless, trends are developing that suggest experience has been misrepresented anecdotally when describing authors' interactions with predatory journals.

Findings are inconclusive concerning professorial rank as it relates to knowledge of predatory publishing. This may be due to both varying research methodologies and international inconsistencies in ranks and positions, making comparisons tenuous. Swanberg et al. (2020) did not find any significant differences in faculty members' ability to identify predatory OA journals based on rank; but Pyne (2017) compared publications of Canadian business school faculty to Beall's list and found predatory publications increase with academic rank. Boukacem-Zeghmouri et al. (2023), who surveyed authors who published in OMICS journals, a known deceptive publisher (Federal Trade Commission 2019), found that 38.6% of their respondents held the rank of Professor or Associate Professor. Similarly, Wang et al. (2023), studying Chinese authors in predatory biomedical journals, found Chief Physicians and Professors accounted for over half of the authors. Many additional studies include demographic questions on rank or position but do not provide context on its influence on an individual's knowledge or experience with predatory practices.

Experience described as a factor of time is often closely related to rank and position; however, it offers more precision and objectivity. Thus, studies report more empirically measurable time variables, such as years employed in academia or periods defined by distinctive career benchmarks. Severin et al. defined and applied 'academic age' as 'the date of the last publication minus the date of the first publication' (2021, 3). In their analysis

of article reviewers, they found that authors who provided peer review to predatory journals had less experience in terms of years in academia, number of publications, and number of reviews. Yet Perlin et al. (2018) found that the greater time from doctoral degree completion was positively related to the publication of a predatory article for Brazilian authors, and Boukacem-Zeghmouri et al. (2023) found that 65% of OMICS authors had been in academia for more than 10 years.

Methodologically, ECRs have been identified by investigators as authors who may have less experience. In an international study of solely ECRs, Nicholas et al. (2023) defined them as researchers under the age of 40 who have or are obtaining a doctorate and do not hold established or tenured positions. This research found that 63% of ECRs were aware of questionable practices including those exhibited by predatory journals. In an earlier publication resulting from the same data, investigators found that only one of 116 participants had published in a predatory journal (Nicholas et al. 2021). They concluded that, 'Yes, the pressure to publish was there for most, but not all, however they rarely published in journals they did not know or which were not known to mentors' (p. 62). Similarly, in a large study that investigated the perceptions and prevalence of predatory publishing, Elliott et al. (2022) concluded that early-, mid-, and advanced-career researchers were equally prone to publish in predatory outlets, and most were unaware that they were doing so.

A divergent set of variables relate directly to publishing history. Xia et al. (2015) found that authors of predatory journal articles had fewer publications than those who published in respected OA journals, and Severin et al. (2021) found that scholars who reviewed for predatory journals had fewer publications of their own than those who worked with legitimate outlets. Although a specific correlation was not reported, Hashish et al. concluded that nursing 'faculty members who had prior experience publishing articles were more likely to be knowledgeable about the distinguishing features of both predatory and legitimate journals' (Hashish et al. 2024, p. 6). Conversely, studies have determined that authors with greater numbers of predatory publications had more publications overall (Bagues et al. 2019; Frandsen 2022). This may be explained by scholars' intentional use of predatory journals to inflate their numbers for purposes of promotion and tenure (Alrawadieh 2018; Bagues et al. 2019). These conflicting findings suggest that publication history is a predictor for knowledge of predatory publishing but not for how a scholar applies that knowledge. It was beyond the scope of this analysis to explore how researchers act upon their awareness of predatory publishing.

1.3 | Author Discipline

Finally, authors' field of study is another variable often investigated in journal author behaviour. Although not a direct measure of experience level, discipline can be considered a confounding variable that affects experience. Comparisons between disciplines are limited due to varying publication trends and expectations, which are compounded by the lack of a standard classification of disciplines in higher education. Circumventing challenges of multidisciplinary methodologies, Shen and Björk (2015) and Perlin et al. (2018) studied the characteristics of

potentially predatory publishers and journals themselves. This research demonstrates that predatory journals exist in all fields. However, the tactics of deceptive outlets often include intentionally broad scopes to attract a wide range of authors, rendering this method of investigation less insightful for understanding disciplinary differences.

Still, evidence exists that demonstrates the uptake of OA journals differs among disciplines, even when disciplines are categorised broadly (Severin et al. 2020; Yan and Li 2018), which indicates the need to consider whether faculty in certain disciplines are more likely to publish in predatory journals. A multidisciplinary study of more than 1800 respondents found that a faculty member's field of study can be used as an indication of their vulnerability to predatory journals (Elliott et al. 2022; InterAcademy Partnership 2022), with those in the arts and humanities more likely to publish in them than their peers. Nagarkar and Khole (2023) found that literature about predatory journals has been published in all four of the major disciplinary areas defined as arts and humanities, medical science, science, and social sciences, with the medical science and science groups accounting for nearly 85%. Swanberg et al. (2020) found that respondents in the social and behavioural sciences were significantly more likely to correctly identify a predatory journal, while no other significant differences between disciplines were found. Additional research is needed to fully understand how knowledge of predatory publishing varies among disciplines, but it is possible that any initial differences are dwindling as both open access and publishing scams become more prevalent in all fields.

1.4 | Research Questions

The findings of existing studies challenge our understanding and assumptions about which researchers are most vulnerable or prone to predatory publishing. The lack of consensus regarding the variables calls for additional investigation. Therefore, the aim of this study was to survey participants across disciplines from US doctoral-granting institutions of higher education. The research questions that guided the development of the full survey instrument addressed components that were outside the scope of this study. The research questions relevant to this analysis were:

1. To what extent do university faculty in the United States claim to be aware of predatory journals?

2. Are different levels of awareness based on faculty members' experience in academia?

3. How should we discuss the concept of experience when it comes to predatory publishing?

2 | Methods

2.1 | Study Design

The study design, survey instrument, and informed consent language preceding the survey were approved by the Institutional Review Boards at TXST, UM, and UNC so that each institution

could collect a portion of the data to share with the other two engaged research institutions. With assistance from the UM UHealth Data Protection Officer, we drafted a data sharing and protection plan which the three institutions individually approved. Although no personally identifying information was explicitly sought, survey data was kept confidential and stored in password-protected electronic files until cleaned and anonymised.

To assess the knowledge and attitudes of university faculty in the United States toward publishing research in academic journals, we developed a cross-sectional, multi-disciplinary survey. The survey was based in part on the work of Webber and Wiegand (2022), which assessed similar aspects of UNC faculty. The survey was piloted with graduate students, faculty researchers, and librarians who would not be part of the sample to test for clarity and internal logic.

The target population for the survey was faculty of any discipline required to conduct and publish research as part of their positions. Our intent was to assess the extent of faculty awareness of predatory publishing, faculty characteristics that might be used to identify audiences most susceptible to predatory publishers, the methods used by faculty to identify predatory journals, and the extent to which predatory publishing is a threat to scholarship and to individual authors. The hypotheses tested by the survey analysis were:

H1. *There are no significant differences across experience variables (years employed, articles published, ECR status) regarding a researcher's reported knowledge level of predatory journals.*

H2. *There are no significant differences between disciplines in researchers' reported knowledge levels of predatory journals.*

The survey consisted of 47 closed- and open-ended items, with 157 total variables and additional branching follow-up questions based on respondent answers. Five sections queried respondents concerning demographics, institutional culture, research, publishing, and peer evaluation experience, and predatory journal knowledge, experiences, and attitudes. All questions in the survey were optional. Survey questions employed in this study can be found in Appendix A, and the full survey is available in openICPSR (https://doi.org/10.3886/E237082V1).

2.2 | Criteria and Definitions

Overall, eligible participants were faculty of any rank whose official workload included at least some portion dedicated to the production of scholarship. A question early in the survey screened out individuals who selected '0%'. The variable *years employed* captured data concerning how many total years the participant had been employed in any higher education position that required research and publication.

For this analysis, eligible cases included those for which the first question in the predatory journal section and at least one of the questions in the demographics section were completed. Two variables were derived from demographic questions included in the survey: ECR status and discipline category. The

definition of an ECR varies in recent literature (Frandsen and Nicolaisen 2024), and for our purposes it is defined as years employed being less than or equal to five in accordance with common tenure timelines. To analyse disciplines, participants were presented with a list of options based on the Classification of Instructional Programs (CIP) codes from the National Center for Education Statistics (https://nces.ed.gov/ipeds/cipcode). An open text box was also provided for those unable to identify their field from the list. With the help of OpenRefine data software (https://openrefine.org), we cleaned and recoded the data from these questions to group participants into broader disciplinary buckets. In accordance with similar recent studies investigating disciplinary differences (Nagarkar and Khole 2023; Severin et al. 2020), we used four categories: arts and humanities, social sciences, sciences, and medicine.

Lastly, the term *predatory journals* was deliberately excluded from the survey invitation materials and was not mentioned until the final section of the survey. To introduce and operationalise the concept, this last section first provided a definition that was constructed by Grudniewicz et al. (2019) in an international meeting of experts and stakeholders. Participants were then asked whether they were knowledgeable about the concept, and they responded to questions that sought to further understand how they had learned about it, where they had encountered it, and their attitudes toward the concept of predatory journals.

2.3 | Participants

Potential peer institutions were identified through a search of the Carnegie Classification of Institutions of Higher Education (https://carnegieclassifications.acenet.edu/institutions). The search was limited to doctoral granting four-year universities with more than 10,000 students that are primarily residential. This included Carnegie Classifications of R1 (Very High Research Activity), R2 (High Research Activity), and D/PU (Doctoral/Professional Universities). Two engaged institutions, UM and TXST, were included in the list of institutions by default. UNC was excluded, as the faculty there had recently been surveyed by Webber and Wiegand (2022), and private for-profit institutions were also excluded. From the resulting lists, we used a mixed sampling method followed by targeted promotion to recruit final participating institutions. We contacted librarians with scholarly communication responsibilities directly and through multiple email listservs. These facilitators at participating institutions agreed to provide faculty email addresses, coordinate with IT departments to ensure survey delivery, and promote participation locally. In return, participating institutions were later sent the deidentified responses from their institution for research or assessment purposes.

The final survey was distributed by email using Qualtrics XM Platform survey software (https://www.qualtrics.com) using a combination of direct email and group list distributions, with follow-up reminders. No incentives were offered to individual participants, although participants were advised of potential benefits to their own institutions through sharing of deidentified responses. The survey was sent to approximately 19,400 faculty at 17 doctoral universities between September 2021 and May 2022. Participating institutions included four R1 institutions,

seven R2 institutions, and six D/PU. The survey was available to respondents for periods ranging between 2.6 and 9.3 weeks, depending on local participating institutions' preferences and schedules.

2.4 | Statistical Analysis

We used SPSS 28.0.1.1 to process the data set. A one-way analysis of variance (ANOVA) was employed to measure whether there is a statistically significant difference in experience based on the respondents' reported levels of knowledge of predatory journals. A Tukey post hoc test was used except in the cases where Levene's test showed that the variances between groups were not equal; in which case, Welch's ANOVA and a Games-Howell post hoc test were used. Chi-square tests were used to study the association between the knowledge level groups and discipline categories. The significance level was set at 0.05.

3 | Results

The data presented reflects a total of 1098 valid responses and an approximate response rate of 5.7% for the survey overall. Because all questions were optional, the number of respondents varied by survey question and is noted for each variable.

Table 1 presents the demographics of respondents. A greater portion of responses came from researchers holding the rank of full professor (40.8%), followed by associate professor (28.6%) and assistant professor (27.9%). Less than 18% of responses came from ECRs. Nearly all respondents (94.2%) held doctoral degrees. Disciplinarily, the greatest number of responses came from the Social Sciences (43.9%) and the fewest from the Arts & Humanities (12.4%).

Variables regarding respondents' publishing history are provided in Table 2. Respondents averaged 17.0 years of experience in faculty roles that required research (henceforth *years employed*). The number of peer-reviewed articles that respondents reported publishing in the 5 years prior to the survey (henceforth *recent articles*) varied greatly. Some reported having published no articles, while the most prolific researcher reported publishing 122 articles. There was an overall mean of 11.9 articles, or approximately 2.4 per year. For context, we also looked at the total number of peer-reviewed articles respondents published during their entire career so far (*career articles*). Nearly 10% of respondents reported publishing over 101 articles, while only 2.8% reported publishing no articles at this point in their careers.

In the final section of the survey, respondents were provided with a description of predatory journals and asked to report their knowledge on a three-point Likert scale (see Appendix A). A slight majority (51.8%) of respondents reported being *somewhat knowledgeable* about predatory journals. A minority (11.2%) indicated they were *not at all knowledgeable*, and 37.0% indicated they were *very knowledgeable*.

Figure 1 represents respondents' self-reported levels of knowledge regarding predatory journals broken down by ECR status. The knowledge profile of ECRs paralleled that of non-ECRs in

TABLE 1 | Respondent demographics.

		Frequency	Percent
Faculty rank (n = 1098)	Full Professor	448	40.8
	Associate Professor	314	28.6
	Assistant Professor	306	27.9
	Other	30	2.7
ECR status (n = 1084)	Not ECR	897	82.7
	ECR	187	17.3
Highest degree attained/ in progress (n = 1098)	Doctoral Degree	1034	94.2
	Master's Degree	60	5.5
	Other	3	0.3
	Bachelor's Degree	1	0.1
Discipline category (n = 1085)	Social Sciences	476	43.9
	Health Sciences	253	23.3
	Sciences	219	20.2
	Arts & Humanities	134	12.4
	Other	3	0.3

Note: Percentages may not add up to exactly 100% due to rounding.

TABLE 2 | Respondent publishing history.

	Min.	Max.	Mean	Median	Std. Dev.
Years employed (n = 1084)	0.0	60.0	17.0	15.0	11.6
Recent articles (n = 1092)	0.0	122.0	11.9	7.0	13.7

	Range	Frequency	Percent
Career articles (n = 1097)	0	31	2.8
	1–5	148	13.5
	6–15	275	25.1
	16–30	231	21.1
	31–50	140	12.8
	51–100	163	14.9
	101+	109	9.9

Note: Percentages may not add up to exactly 100% due to rounding.

that a majority of both ECR and non-ECR respondents reported being *somewhat knowledgeable* (58.3% and 50.3%), a minority reported being *not at all knowledgeable* (10.2% and 11.3%), and about one-third reported being *very knowledgeable* (31.6% and 38.5%). A chi-square test demonstrated no significant relationship between ECR status and knowledge level of predatory journals ($X^2(2, N = 1084) = 4.07, p = 0.13$).

The results of an ANOVA revealed a statistically significant difference between levels of knowledge when comparing the mean *years employed* ($F(2,1081) = 3.544, p = 0.029$). Tukey's post hoc test showed that respondents who indicated they were *very knowledgeable* ($M = 16.2$) had a statistically significant lower average *years employed* than those who indicated they were *not at all knowledgeable* ($M = 19.3$) by 3.2 years (Figure 2). There was no statistically significant difference between the *somewhat knowledgeable* group and the *very knowledgeable* group ($p = 0.495$) or the *not at all knowledgeable* group ($p = 0.110$). A summary of p-values and effect sizes is provided in Appendix B.
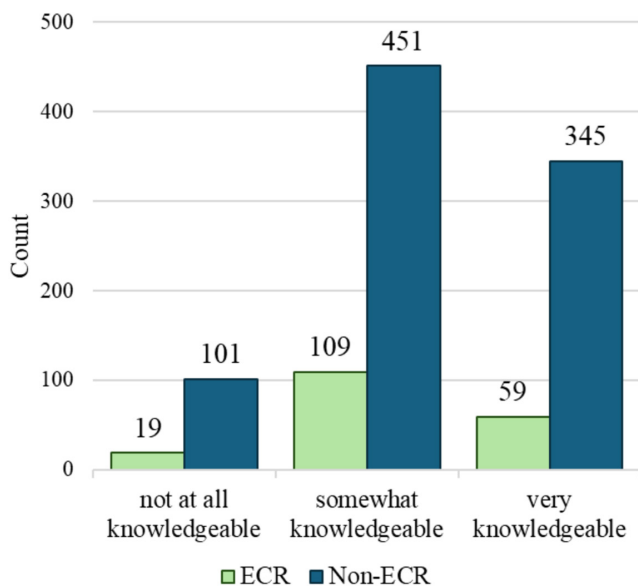
Figure 3 shows the results of a Welch's ANOVA which demonstrated a statistically significant difference between levels of knowledge when comparing the mean number of *recent articles* ($F(2,366.827) = 16.960, p < 0.001$). A Games-Howell post hoc test showed that respondents who selected *very knowledgeable* had published a significantly higher number of articles ($M = 15.0$) compared to those who selected either *somewhat knowledgeable* ($M = 10.3$) or *not at all knowledgeable* ($M = 8.8$). There was no statistically significant difference between the *somewhat knowledgeable* group and the *not at all knowledgeable* group ($p = 0.361$).

When comparing the knowledge levels of disciplines (Figure 4), a chi-square test showed that there was no significant relationship between the variables ($X^2(6, N = 1082) = 5.78, p = 0.45$). Across all disciplines, most respondents identified as *somewhat knowledgeable* about predatory journals, while a lesser number identified as *very knowledgeable*, and the least number in each discipline identified as *not at all knowledgeable*.

Examination of the number of years employed and *recent articles* by discipline established that the average of *years employed* was highest for the Sciences at 19.8 years and lowest for the Social Sciences at 15.6 years (Figure 5). The averages of *recent articles* had a greater range, with the Sciences and Health Sciences having published 17.4 and 14.6 articles, respectively, and the Arts & Humanities and Social Sciences having published 5.9 and 9.7 articles, respectively (Figure 6).

Figure 5 presents a set of boxplots for each individual discipline of *years employed* broken down by knowledge level groups.

FIGURE 1 | Knowledge of predatory journals by ECR status.
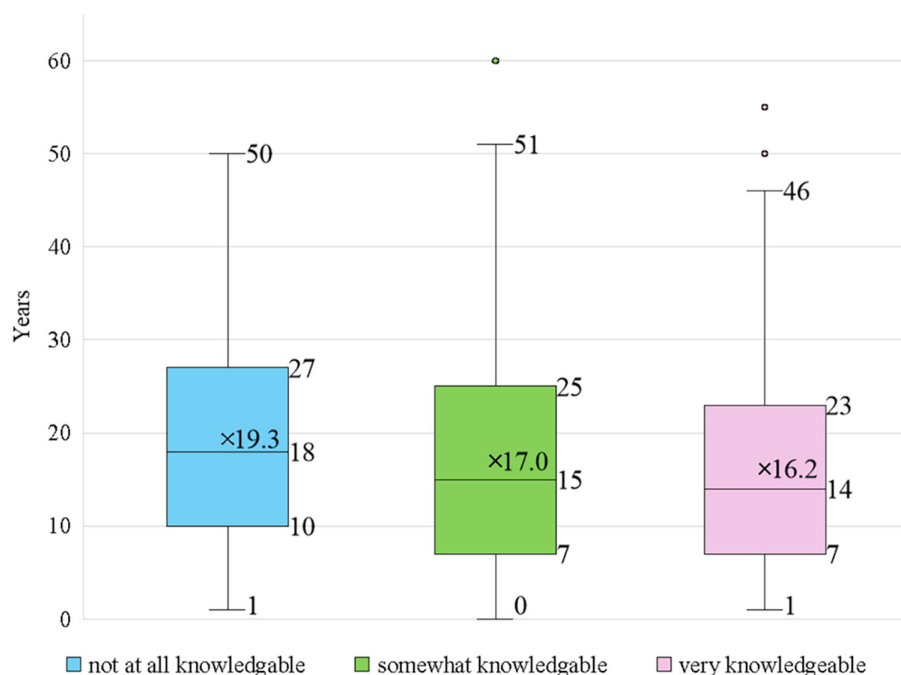
FIGURE 2 | Boxplot of years employed grouped by knowledge of predatory journals.

ANOVA tests demonstrated no significant differences between groups for either the Sciences ($F(2,215)=0.491$, $p=0.612$) or the Health Sciences ($F(2,246)=0.732$, $p=0.482$). However, there was a significant difference for the Arts & Humanities ($F(2,129)=4.228$, $p=0.017$), with post hoc tests revealing a significant difference between *very knowledgeable* ($M=15.4$) and *not at all knowledgeable* ($M=24.7$). Similarly, there was significance for the Social Sciences ($F(2,124.372)=4.360$, $p=0.015$), with a significant difference between *very knowledgeable* ($M=14.1$) and *not at all knowledgeable* ($M=20.4$). Neither discipline exhibited significance when comparing the *somewhat knowledgeable* group.

When analysing the boxplots of *recent articles* broken down by knowledge level groups for each discipline, ANOVA tests again demonstrated no significant differences between groups for the Sciences ($F(2,216)=1.330$, $p=0.267$). Both the Arts & Humanities and the Health Sciences again revealed significant differences between *very knowledgeable* ($M=9.7$ and $M=17.4$,
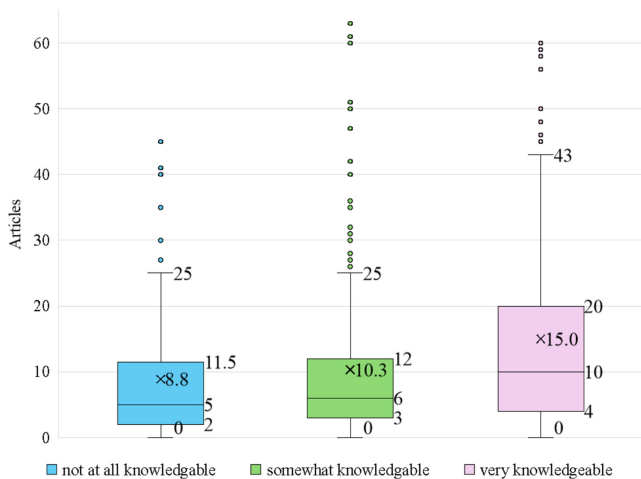
respectively) and *not at all knowledgeable* ($M=3.6$ and $M=8.5$, respectively), with no significance involving the *somewhat knowledgeable* group. The Social Sciences not only showed significance between the *very knowledgeable* group ($M=12.6$) and the *not at all knowledgeable* group ($M=6.6$), but also between the *very knowledgeable* group and the *somewhat knowledgeable* group ($M=8.2$).

Finally, we examined the differences between ECRs and non-ECRs by discipline. There was no significant difference between ECRs and non-ECRs in the Arts & Humanities ($X^2(2$, $N=132)=3.713$, $p=0.156$), the Health Sciences ($X^2(2$, $N=249)=2.724$, $p=0.256$), or the Social Sciences ($X^2(2$, $N=470)=1.985$, $p=0.371$). The only significance found between these groups when using a chi-square test was in the Sciences (X^2, $N=218)=6.546$, $p=0.038$). Initial analysis indicates that researchers in the Sciences more often express that they are *somewhat knowledgeable* about predatory journals than their counterparts in the Arts & Humanities, Health Sciences, and Social Sciences. Extended analysis is needed to understand the significance within this discipline. There was no significant difference between ECRs and non-ECRs in the Arts & Humanities ($X^2(2$, $N=132)=3.713$, $p=0.156$), the Health Sciences ($X^2(2$, $N=249)=2.724$, $p=0.256$), or the Social Sciences ($X^2(2$, $N=470)=1.985$, $p=0.371$).

4 | Discussion

This study focused on US researchers' self-reported knowledge of predatory journals in relation to various measures of experience in academia while taking into account broadly defined discipline categories. The results reveal that H1, which anticipated no significant differences between knowledge levels when examining experience variables, was not supported when analysing the sample as a whole for two of the three measures of experience. There were significant differences between knowledge level groups for both *years employed* and *recent articles*, but

FIGURE 3 | Boxplot of recent articles grouped by knowledge of predatory journals. Note: outliers over 65 not shown.
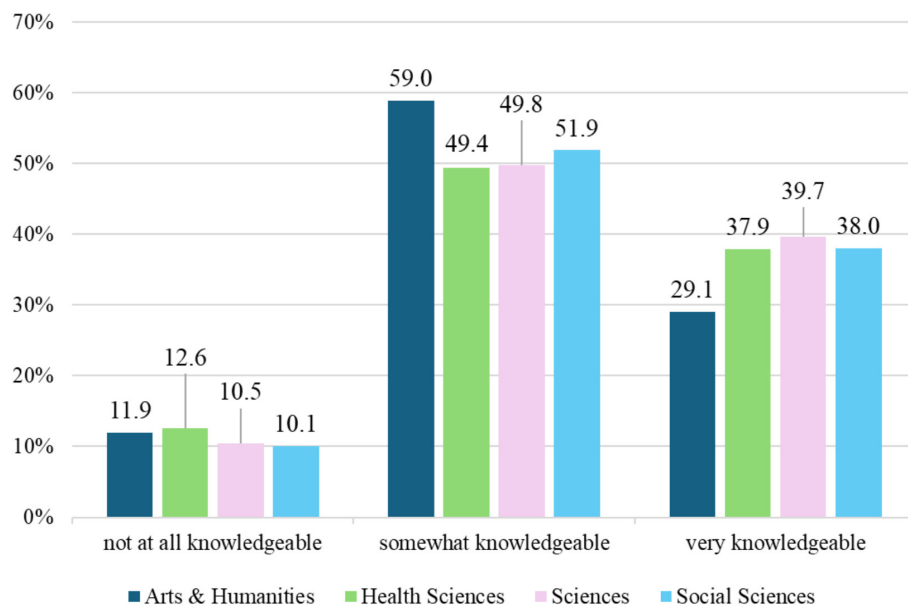
FIGURE 4 | Knowledge levels by discipline.
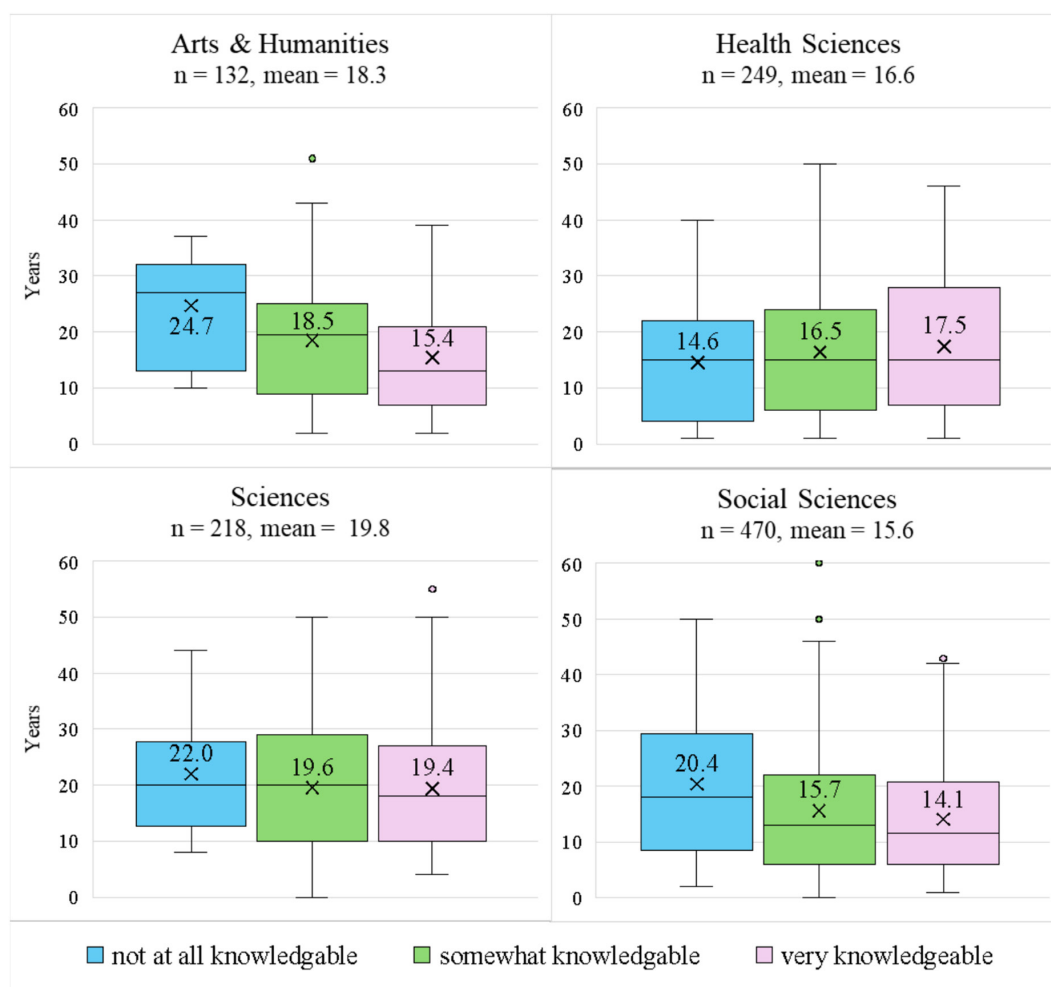
FIGURE 5 | Discipline boxplots of years employed grouped by knowledge of predatory journals.

there was no significant difference between groups for ECRs versus non-ECRs. Conversely, H2 was supported; there was no significant difference between self-reported knowledge levels and disciplines when analysing the sample as a whole. However, when the individual variables from H1 were introduced and analysed with researchers' disciplines, significant differences were observed.

In accordance with previous studies, the majority of participants claimed to have some knowledge of predatory journals. Our data are the first to demonstrate that US faculty who are *not at all knowledgeable* about predatory journals have been employed in higher education longer than those who report being *very knowledgeable*. This trend was particularly evident in the Arts & Humanities and the Social Sciences discipline categories. While Severin et al. (2021) found the opposite to be true for peer reviewers of predatory journals, our data align with the findings of Perlin et al. (2018) and Boukacem-Zeghmouri et al. (2023) whose studies focused on authors. One explanation may be due to predatory publishing being a relatively new issue in academic publishing. Researchers who are further distanced from their graduate school education—or the early years of learning to publish journal articles—likely received less training on predatory publishing. This would suggest that, currently, faculty with more years employed are a population that has a greater need for formal predatory publishing training. However, this may not be the case in the long term if graduate students are being exposed to journal publishing trends and best practices in their programs of study.

Comparison between ECR and non-ECR groups did not follow this pattern. This indicates that any significant difference occurred outside of the five-year cutoff that we used to define ECR status. Reasonably, it may be that ECRs gained knowledge of predatory practices in their recent degree programs and later-stage researchers are gaining knowledge from greater participation in journal publishing activity. For this reason, we conclude that ECR status is not a reliable marker indicating knowledge of predatory publishing. Additional research and a consistent definition of ECR are necessary to make firm conclusions about how the number of years employed directly influences a faculty member's knowledge of predatory journals. At the same time, a recent paper by Nicholas et al. concludes, 'Despite their relatively outwardly "lowly" station many ECRs are in fact experienced, battle-hardy researchers' (Nicholas et al. 2024, 10), suggesting that this line of research does not require further investigation.

Our findings indicate that there is greater significance when focusing on the number of articles a researcher has published in the past 5 years. Those who reported being the most knowledgeable about predatory publishing had produced considerably more recent articles than those who reported having no knowledge. This
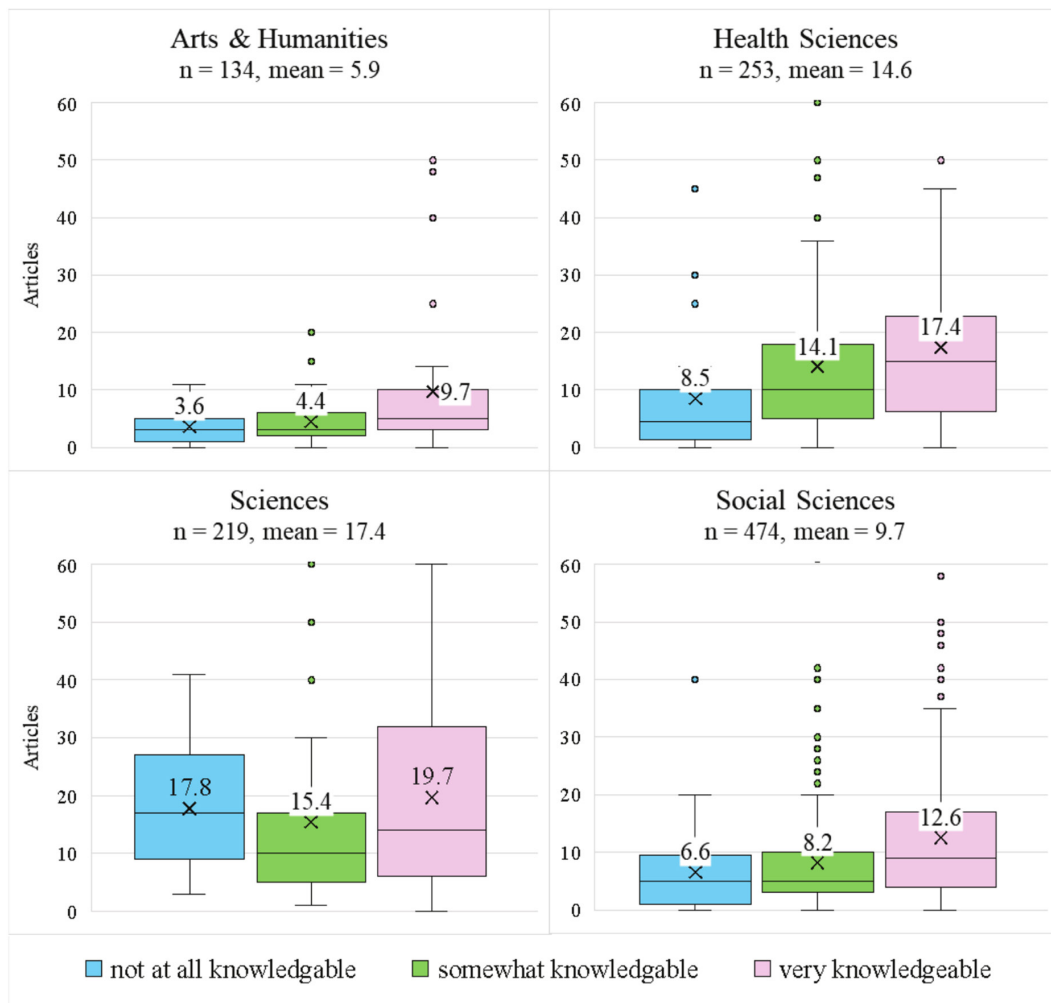
FIGURE 6 | Discipline boxplots of recent articles grouped knowledge of predatory journals. Note: outliers over 60 not shown.

supplies evidence that the article publication history of an individual is a more accurate indicator of whether researchers are informed about predatory publishing. It appears it is through direct exposure to the journal publication process that researchers become most aware of the phenomenon of predatory publishing. Conversely, Swanberg et al. (2020) found no significant difference in faculty members' ability to identify predatory journals based on publication history. The evidence in the current literature in this area is particularly convoluted depending on the methodologies of the various studies. Those that studied populations of authors who published in predatory outlets are largely international in scope and based on bibliometrics. It is difficult to make solid comparisons with these studies, as the variance in outcomes may be primarily explained by the differences in populations and methodologies. If publication history is associated with knowledge of predatory publishing, subsequent research should investigate how this knowledge is formed in order to pre-empt learning by way of mistakes or desperation.

It may appear contradictory, finally, that the findings indicate that both faculty who have been employed fewer years and faculty who have more established published history report greater knowledge of predatory journals. However, this highlights a particular cross-section of faculty who are established in their careers and who have not published a substantial number of recent journal articles. In regard to both variables of *years employed* and *recent articles*, the Arts & Humanities and Social Sciences discipline categories stood out. This may be attributed to journal article publishing being a more common scholarly output in some fields than others. With faculty in Arts & Humanities and Social Sciences both publishing fewer than 10 *recent articles* on average and Health Sciences and Sciences publishing approximately 16 articles on average, it is logical that there are differences in these broadly defined disciplinary groups that influence knowledge and awareness of predatory publishing. Fewer journal publications overall mean that faculty authors would be less exposed to predatory publishing practices, and ultimately there are those who may never need such knowledge based on the types of scholarship they produce.

5 | Limitations

The survey instrument employed was exploratory in nature and not validated. Our sample may not accurately reflect the target population due to some reliance on convenience sampling of institutional participants and their willingness to be involved. The instrument consisted of a relatively large number of questions addressing a topic that inherently has some stigma attached to

it. These factors likely deterred some individual participants, thus suppressing the completion rate, and may have affected the candour of responses received. The nature of the survey may have influenced respondents' full disclosure; in particular, some respondents may have over- or understated their knowledge of predatory publishing based on whether they felt as though they should know about the concept. Ultimately, the survey measured self-reported knowledge and perceptions, and it did not test respondents' actual comprehension, which limits the interpretation and application of the results. Finally, our tests do not indicate directionality in association; that is, we cannot claim definitively that a higher number of recent articles causes an increased knowledge level or vice versa.

6 | Conclusions

This study aims to understand faculty knowledge of predatory journals in the United States, as previous studies have not isolated this population. After analysing factors that indicate faculty experience, our data provided evidence that the most reliant indicator of knowledge regarding predatory journals is the number of articles recently published. These results have implications for how to approach faculty with professional development regarding journal publishing trends. With the growth of predatory journals, predatory conferences, and the potential for new predatory outlets, it may prove impossible for faculty of any discipline to remain ignorant of related scholarship scams. A nuanced understanding of predatory publishing awareness and researchers' publishing knowledge across disciplines will prepare journal authors for the future by informing graduate and faculty training.

The amount of data our survey collected exceeded what could be presented in this article. Additional data that was collected includes how respondents learned about predatory publishing, whether they have been directly involved in or affected by it, and how it is regarded in their field. Statistical analysis of this data may provide additional insights that explain the causes and associations between variables presented in this article. While we are continuing to examine the results of the survey, we have also made the data set openly available for subsequent research by others interested in the topic.

Conflicts of Interest

The authors declare no conflicts of interest.

References

Alrawadieh, Z. 2018. "Publishing in Predatory Tourism and Hospitality Journals: Mapping the Academic Market and Identifying Response Strategies." *Tourism and Hospitality Research* 20, no. 1: 72–81. https://doi.org/10.1177/1467358418800121.

Bagues, M., M. Sylos-Labini, and N. Zinovyeva. 2019. "A Walk on the Wild Side: 'Predatory' Journals and Information Asymmetries in Scientific Evaluations." *Research Policy* 48, no. 2: 462–477. https://doi.org/10.1016/j.respol.2018.04.013.

Boukacem-Zeghmouri, C., L. Pergola, and H. Castaneda. 2023. "Exploring Authors Engagement in Journals With Questionable Practices: A Case Study of OMICS." *Malaysian Journal of Library & Information Science* 28, no. 2: 103–128. https://doi.org/10.22452/mjlis.vol28no2.6.

Demir, S. B. 2018. "Predatory Journals: Who Publishes in Them and Why?" *Journal of Informetrics* 12, no. 4: 1296–1311. https://doi.org/10.1016/j.joi.2018.10.008.

Elliott, T., B. Fazeen, A. Asrat, et al. 2022. "Perceptions on the Prevalence and Impact of Predatory Academic Journals and Conferences: A Global Survey of Researchers." *Learned Publishing* 35, no. 4: 516–528. https://doi.org/10.1002/leap.1458.

Federal Trade Commission. 2019. "Court Rules in FTC's Favor Against Predatory Academic Publisher OMICS Group; Imposes $50.1 million Judgment Against Defendants That Made False Claims and Hid Publishing Fees [Press Release]." https://www.ftc.gov/news-events/news/press-releases/2019/04/court-rules-ftcs-favor-against-predatory-academic-publisher-omics-group-imposes-501-million-judgment.

Frandsen, T. F. 2022. "Authors Publishing Repeatedly in Predatory Journals: An Analysis of Scopus Articles." *Learned Publishing* 35, no. 4: 598–604. https://doi.org/10.1002/leap.1489.

Frandsen, T. F., and J. Nicolaisen. 2024. "Defining the Early Career Researcher: A Study of Publication-Based Definitions." *Learned Publishing* 37, no. 4: e1621. https://doi.org/10.1002/leap.1621.

Grudniewicz, A., D. Moher, K. D. Cobey, et al. 2019. "Predatory Journals: No Definition, no Defence." *Nature* 576: 210–212. https://doi.org/10.1038/d41586-019-03759-y.

Habiba, U., and S. M. Z. Ahmed. 2024. "Understanding and Mitigating the Menace of Predatory Journals: Perspectives of University Teachers in Bangladesh." *Journal of Academic Ethics* 23: 305–328. https://doi.org/10.1007/s10805-024-09538-3.

Hashish, E. A. A., S. A. Alsenany, and S. M. F. Abdelaliem. 2024. "Investigating Academic Nurse Researchers' Knowledge, Experience, and Attitude Toward Predatory Journals." *Journal of Professional Nursing* 51: 1–8. https://doi.org/10.1016/j.profnurs.2024.01.003.

InterAcademy Partnership. 2022. *Combatting Predatory Academic Journals and Conferences.* InterAcademy Partnership. https://apo.org.au/node/316970.

Kharumnuid, S. A., and P. Singh Deo. 2024. "Researchers' Perceptions and Awareness of Predatory Publishing: A Survey." *Accountability in Research* 31, no. 5: 479–496. https://doi.org/10.1080/08989621.2022.2145470.

Kurt, S. 2018. "Why Do Authors Publish in Predatory Journals?" *Learned Publishing* 31, no. 2: 141–147. https://doi.org/10.1002/leap.1150.

Mertkan, S., G. Onurkan Aliusta, and N. Suphi. 2021. "Knowledge Production on Predatory Publishing: A Systematic Review." *Learned Publishing* 34, no. 3: 407–413. https://doi.org/10.1002/leap.1380.

Moher, D., L. Shamseer, K. D. Cobey, et al. 2017. "Stop This Waste of People, Animals and Money." *Nature* 549, no. 7670: 23–25. https://doi.org/10.1038/549023a.

Nagarkar, S., and S. Khole. 2023. "Predatory Journals: Quantitative and Qualitative Analysis of Literature Published Between 2012 and 2021." *Journal of Scholarly Publishing* 54, no. 1: 80–102. https://doi.org/10.3138/jsp-2022-0005.

Nicholas, D., E. Herman, A. Watkinson, et al. 2021. "Early Career Researchers Between Predatory Publishing and Academic Excellence: The Views and Behaviours of the Millennials." *Foresight and STI Governance* 15, no. 1: 56–65. https://doi.org/10.17323/2500-2597.2021.1.56.65.

Nicholas, D., J. Revez, A. Abrizah, et al. 2024. "Purchase and Publish: Early Career Researchers and Open Access Publishing Costs." *Learned Publishing* 37, no. 4: e1617. https://doi.org/10.1002/leap.1617.

Nicholas, D., B. Rodríguez-Bravo, C. Boukacem-Zeghmouri, et al. 2023. "Early Career Researchers and Predatory Journals During the Covid-19 Pandemic. An International Analysis." *El Profesional de la Información* 32, no. 1: e320117. https://doi.org/10.3145/epi.2023.ene.17.

Perlin, M. S., T. Imasato, and D. Borenstein. 2018. "Is Predatory Publishing a Real Threat? Evidence From a Large Database Study." *Scientometrics* 116, no. 1: 255–273. https://doi.org/10.1007/s11192-018-2750-6.

Powell, K. R., and J. M. Kupsco. 2018. "Prevalence of Publishing in Predatory Journals at Emory University [Poster Presentation]." Paper presented at the 118th Annual Meeting of the Medical Library Association, Atlanta, GA, United States. https://doi.org/10.6084/m9.figshare.6349331.v2.

Pyne, D. 2017. "The Rewards of Predatory Publications at a Small Business School." *Journal of Scholarly Publishing* 48, no. 3: 137–160. https://doi.org/10.3138/jsp.48.3.137.

Severin, A., M. Egger, M. P. Eve, and D. Hürlimann. 2020. "Discipline-Specific Open Access Publishing Practices and Barriers to Change: An Evidence-Based Review." *F1000Research* 7: 1925. https://doi.org/10.12688/f1000research.17328.2.

Severin, A., M. Strinzel, M. Egger, M. Domingo, and T. Barros. 2021. "Characteristics of Scholars Who Review for Predatory and Legitimate Journals: Linkage Study of Cabells Scholarly Analytics and Publons Data." *BMJ Open* 11, no. 7: e050270. https://doi.org/10.1136/bmjopen-2021-050270.

Shehata, A. M. K., and M. F. M. Elgllab. 2018. "Where Arab Social Science and Humanities Scholars Choose to Publish: Falling in the Predatory Journals Trap." *Learned Publishing* 31, no. 3: 222–229. https://doi.org/10.1002/leap.1167.

Shen, C., and B. Björk. 2015. "'Predatory' Open Access: A Longitudinal Study of Article Volumes and Market Characteristics." *BMC Medicine* 13, no. 1: 230. https://doi.org/10.1186/s12916-015-0469-2.

Swanberg, S. M., J. Thielen, and N. Bulgarelli. 2020. "Faculty Knowledge and Attitudes Regarding Predatory Open Access Journals: A Needs Assessment Study." *Journal of the Medical Library Association* 108, no. 2: 208–218. https://doi.org/10.5195/jmla.2020.849.

Wallace, F. H., and T. J. Perri. 2018. "Economists Behaving Badly: Publications in Predatory Journals." *Scientometrics* 115, no. 2: 749–766. https://doi.org/10.1007/s11192-018-2690-1.

Wang, J., C. Yang, and M. Chen. 2023. "Who Is Publishing in Biomedical Predatory Journals? A Study on Chinese Scholars." *Journal of Scholarly Publishing* 54, no. 2: 290–312. https://doi.org/10.3138/jsp-2022-0066.

Webber, N., and S. Wiegand. 2022. "A Multidisciplinary Study of Faculty Knowledge and Attitudes Regarding Predatory Publishing." *Journal of Librarianship and Scholarly Communication* 10, no. 1: 10.31274/jlsc.13011.

Xia, J., J. L. Harmon, K. G. Connolly, R. M. Donnelly, M. R. Anderson, and H. A. Howard. 2015. "Who Publishes in "Predatory" Journals?" *Journal of the Association for Information Science and Technology* 66, no. 7: 1406–1417. https://doi.org/10.1002/asi.23265.

Yan, E., and K. Li. 2018. "Which Domains Do Open-Access Journals Do Best in? A 5-Year Longitudinal Study." *Journal of the American Society for Information Science and Technology* 69, no. 6: 844–856. https://doi.org/10.1002/asi.24002.

Appendix A

Survey Questions

D01 What is the highest level of experience/faculty rank you have achieved in higher education?

- Full Professor
- Associate Professor
- Assistant Professor
- Research Fellow
- Postdoctoral Researcher
- Adjunct Professor
- Lecturer
- Instructor
- Resident (medical)
- Other: _____

D02 What percentage of your current official workload is dedicated to producing scholarship, as required by your position description or contract?

- 0% (this will conclude your participation in the survey)
- 1%–12%
- 13%–25%
- 26%–50%
- 51%–75%
- 76%–99%
- 100%

D03 How many years have you been employed in higher education in a role in which you were required to conduct research and publish (or produce equivalent types of scholarship/creative works in your field)?

Enter nearest whole number: _____

D04 What is the highest degree you have attained?

- Bachelor's Degree
- Master's Degree
- Doctoral Degree
- Other _____

D05 Type a keyword for your discipline in the box below and select the suggestion that best matches your area of study. You may need to try a couple of different keywords. If your field is particularly interdisciplinary or you feel it is not adequately represented in this list, type your response in the open text box in the next question.

_____

D06 If not found above, enter your discipline in the space below:

_____

H01 How many peer-reviewed articles have you published in the last 5 years?

   Enter nearest whole number: _____

H02 How many peer-reviewed articles have you published during your entire academic career?

- 0
- 1–5
- 6–15
- 16–30
- 31–50
- 51–100
- 101+

P00 "Predatory journals and publishers are entities that prioritize self-interest at the expense of scholarship and are characterized by false or misleading information, deviation from best editorial and publication practices, a lack of transparency, and/or the use of aggressive and indiscriminate solicitation practices" (Grudniewicz et al. 2019).

Predatory publishers and journals promise and promote indicators of quality that they do not necessarily deliver, such as peer review, copy editing, reputable editorial boards, and meaningful impact metrics. Predatory journals may also be known as deceptive, exploitative, fake, faux, hijacked, hoax, illegitimate, scam, or trash journals.

P01.1 Prior to having read the description above, what was your knowledge level of predatory journals?

- Not at all knowledgeable
- Somewhat knowledgeable
- Very knowledgeable

Appendix B

See Table B1.

TABLE B1 | Significance tables.

	Sample				
Groups	**All**	**Art/Hu**	**Health**	**Sciences**	**Social Sci**
Years employed ANOVA post hoc tests					
Not at all/somewhat	0.11	0.093	0.696	0.622	0.089
Somewhat/very	0.495	0.31	0.811	0.997	0.311
Very/not at all	0.022*	0.012*	0.457	0.605	0.016*
Effect size	0.007	0.062	0.006	0.005	0.024
Recent articles ANOVA post hoc tests					
Not at all/somewhat	0.361	0.657	0.112	0.837	0.416
Somewhat/very	<0.001*	0.052	0.186	0.237	<0.001*
Very/not at all	<0.001*	0.029*	0.006*	0.898	<0.001*
Effect size	0.032	0.092	0.039	0.012	0.046
	Sample				
Variables	**All**	**Art/Hu**	**Health**	**Sciences**	**Social Sci**
ECR status/knowledge chi-squares					
ECR status/knowledge level	0.13	0.156	0.256	0.038*	0.371
Variables					**All**
Discipline/knowledge chi-square					
Discipline/knowledge level					0.448

*indicates significant at 0.05.