



How metric-based performance evaluation systems fuel the growth of questionable publications?

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Abstract

The proliferation of questionable publishing practices has raised serious concerns in academia, prompting numerous discussions and investigations into the motivations behind researchers' preference for such journals. In this study, we aimed to explore the impact of current academic performance evaluation systems on scholars' questionable journal preferences in Turkey. Utilizing data from the comprehensive study conducted by Kulczycki et al. (2021) on questionable journals, we analyzed the academic careers of 398 researchers who authored 417 articles in this context. Our findings reveal a clear association between current research evaluation systems and journal selection, particularly during the process of applying for associate professorship. Notably, 96% of the articles published in questionable journals were listed in scholars' academic profiles, indicating their use in academic promotion or incentive portfolios. While this study contributes valuable insights into the relationship between academic performance evaluation systems and questionable journal preferences, additional research is required to comprehensively understand the motivations behind scholars' publishing choices and to devise effective strategies to combat questionable publishing practices in academia.

Keywords Predatory journals · Questionable publishing · Academic performance evaluation · Academic career · Higher education · Turkey

Introduction

According to the Dictionary of Modern Proverbs (Doyle et al., 2012), the concept of “publish or perish” first emerged in 1927 in the following sentence: “*If it be true that...the quality of American sociological writing is in inverse relation to its quantity, the reason is to be sought, among other things, in the fact, first, that the system of promotion used in our universities amounts to the warning, ‘Publish or perish!’*” (Case, 1927).

Almost a century has passed, and the system of promotion that prioritized publish or perish has fundamentally transformed academia. Researchers' primary goal shifted to

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sharing their work through scholarly academic journals, with the focus now on quantity rather than curiosity or problem-solving. Consequently, the number of publications has steadily increased each year. This problem has been termed “the strain on scientific publishing” recently, due to a 47% rise in publications in only 6 years (Hanson et al., 2023). While debates persist regarding the legitimacy and problems of university rankings (Brankovic et al., 2022; Doğan & Al, 2019; Wilbers & Brankovic, 2021), universities and research institutions strive to secure a position in these rankings to gain visibility and exert pressure on their researchers for publishing more each year (Hanson et al., 2023). This encourages a general policy of increasing the number of publications, creating an atmosphere where all researchers, regardless of their field of study, face the message of publish or perish (Linton et al., 2011, p. 245). The emphasis on ceaselessly publishing content, regardless of its substance, leads researchers to prioritize quantity over research and other educational, training, or managerial responsibilities (Rawat & Meena, 2014, p. 87). Simultaneously, the publish or perish architecture diverts scientists’ focus away from rigorous scientific practice and their contributions to society, limiting the primary purpose of producing publications (Williams, 2021). The escalating competition in academia compels scientists to generate publishable results, leading to contradictions regarding the objectivity and integrity of research (Fanelli, 2010). In tandem, as highlighted by Feenstra and Delgado López-Cózar (2023), metric-based research evaluation system impact researchers’ publication habits, including preferences for document types and publication languages, research agendas, and teaching work. More significantly, these systems have adverse effects on researchers’ mental health and contribute to increased misconduct in research.

The pressure to publish in top-tier journals and secure external funds has been identified as a catalyst for misconduct and misbehavior (Holtfreter et al., 2020). Inappropriate authorship (violations of authorship rules), manipulation/falsification, fabrication, and plagiarism are recognized as common forms of academic misconduct, with research evaluation systems being identified as the primary cause (Liao et al., 2018; Pupovac et al., 2017). These issues not only erode trust in ethical bodies and academia among researchers, but also lead some researchers to opt for quicker and easier publication of their articles. This trend is exacerbated by academic promotion and incentive policies that prioritize the quantity of scientific publications over their content. All these developments have given rise to a new sector of publishing: outlets where quick publication is prioritized, often at the expense of rigorous evaluation criteria. These journals typically lack expert editorial staff, lack scientific rigor, and are not affiliated with academic institutions (Kurt, 2018, p. 142). Such journals, commonly referred to as *predatory* in the literature and posing a significant threat to the academic community (Beall, 2016), exhibit main characteristics defined as providing false or misleading information, deviation from the best editorial and publication practices, lack of transparency, and aggressive and indiscriminate solicitation (Grudniewicz et al., 2019). Predatory practices extend beyond journals and encompass predatory conferences and congresses (Kulczycki et al., 2022a), as well as predatory awards (Pal et al., 2022). However, in this study, we choose not to employ the term *predatory* but rather refer to them as *questionable*. This choice is grounded in our acknowledgment that detecting and conceptualizing predatory activities is highly challenging and can be influenced by perspectives from both central and peripheral countries (Krawczyk & Kulczycki, 2021). Additionally, considering that most researchers publishing in questionable journals are inexperienced researchers from developing countries (Xia et al., 2015), and recognizing the role of questionable journals in disseminating research outputs from emerging research

systems in peripheral countries (Mills & Inouye, 2021; Taşkın et al., 2023), we believe it is essential to highlight the research evaluation systems that give rise to questionable practices rather than solely focusing on the products of these systems.

Factors influencing academics' preference for questionable publishing

The factors influencing academics' preference for publishing in questionable journals can indeed be attributed to ignorance or a lack of knowledge regarding journal selection. However, studies in the literature indicate that academics consciously choose questionable publishing to expedite degree attainment, apply for tenure, or participate in incentive programs (Mutlu, 2020). Conversely, the situation slightly differs for young and early career researchers. When the pressure to “publish or have no degree”, institutional publication expectations, and self-efficacy concerns converge, these publishing platforms create a “shadow academy” for young researchers and offer alternative spaces for socialization (Mertkan et al., 2022). All of these aspects make it evident that the primary target for combating questionable publishing lies within the existing research performance evaluation criteria. While discussions revolve around such journals and publishers, they persist due to the absence of a definitive list. However, the fundamental cause of the questionable journal issue lies in the desire for quick and effortless publication, with the primary factor fueling this desire being the current academic promotion and incentive systems. Consequently, fighting against questionable journals appears implausible without substantial improvements to these academic promotion and incentive systems.

Based on all of these factors, the primary objective of this study is to investigate the impact of current academic performance evaluation systems on academics' preferences for questionable journals. In this context, the study focuses on academics in Turkey, which ranks among the top three countries in terms of questionable publication preferences due to incentive allowance system and unawareness of academics (Demir, 2018). The academic careers of these individuals in relation to their questionable publication preferences were investigated. The study aims to address the following research questions:

- Is there a discernible pattern (such as university type, age, geographical location, etc.) among Turkish universities concerning the preference for questionable publications?
- At which stage of their academic careers do academics opt to publish in questionable journals?
- Do the authors of articles published in questionable journals include them in their promotion and tenure portfolios?

Tenure and incentive systems in Turkey

To comprehend the impact of academic performance evaluation systems on the preference for questionable publishing, it is crucial to grasp the fundamental dynamics of the academic system in Turkey. This section of the article provides an overview of the academic promotion and incentive systems in Turkey. By doing so, we aim to shed light on the issue of questionable journals, which has become a concern not only in Turkey but also worldwide.

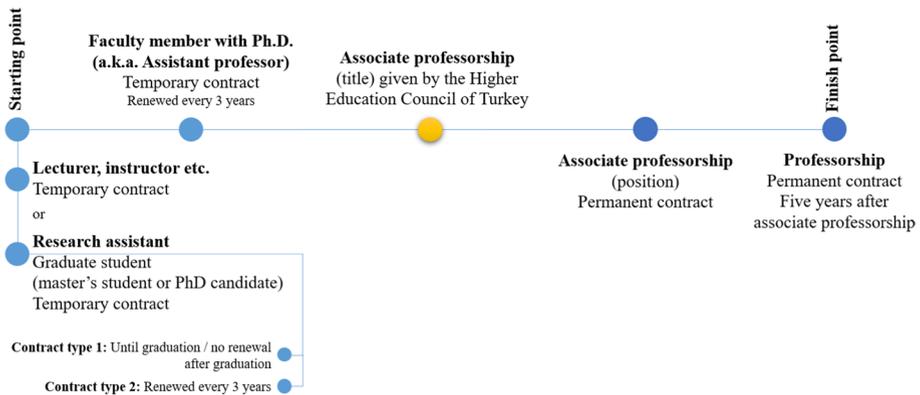


Fig. 1 Tenure system in Turkey

Tenure system

As of July 2023, Turkey’s higher education system comprises a total of 205 active universities, with 127 being state universities and 78 foundation universities. Within these institutions, there are 148,701 academics (99,443 men and 85,258 women, See Appendix 1). Since 1981, all of these universities have been governed by a centralized structure known as the Council of Higher Education (HEC) (The Council of Higher Education, 2018). The average age of these universities is 21 years, with state universities having an average age of 25 (median: 17) and foundation universities having an average age of 15 (median: 14).¹ State universities receive their budgets from the government, whereas foundation universities rely on student income and foundation funds for their financial resources. The hierarchical structure of this system is illustrated in Fig. 1.

The basic structure of the tenure system is as follows (Yükseköğretim Kanunu [Higher Education Law], 1981):

- *Lecturers, instructors, etc.* Individuals with expertise in specific fields are assigned to deliver courses requiring specialized knowledge and expertise in universities. They can be appointed on a temporary contract basis or an hourly fee arrangement. A minimum of a master’s degree with a thesis is required to give lectures. Lecturers can be appointed for a maximum period of two years. At the end of the assignment period, their duties automatically end, although reappointments are possible.
- *Research assistants* They are academic staff members who assist in research, examinations, and experiments in higher education institutions and perform other related duties assigned by authorized bodies. To apply for a research assistant position, individuals must be below the age of thirty-five. They are appointed as research assistants for a maximum period of three years, based on the recommendations of the heads of relevant departments and the approval of the rector. At the end of the appointment period, their duties automatically expire, but they can be reappointed through the same procedure. Two types of contracts are available: One is not renewed after graduation, other is renewed every three years if it is approved by the university/department.

¹ Statistics on Turkish Higher Education System: <https://istatistik.yok.gov.tr/>

- *Faculty members with Ph.D. (assistant professor)* These individuals have successfully completed doctoral studies and hold an academic title. The title was previously known as assistant professor until 2018, but it was changed to "faculty member with Ph.D." after 2018, without any difference in their roles. Vacant positions are announced by the rectorate. The dean of faculties selects three professors or associate professors, one from within the unit and one from outside the higher education institution, to provide written opinions on each candidate's portfolio. After receiving the opinions from the board of directors, the dean submits their recommendations to the rector. The appointment is made by the rector for a maximum period of four years. At the end of each assignment period, the position automatically ends, although reappointment is possible for those whose term has expired.
- *Associate professorship (Doçent) title* An academic who has completed their doctorate can apply for the title of associate professor if they meet the criteria determined by the Interuniversity Board of the Higher Education Council. Applications are received twice a year. The Interuniversity Board appoints a five-member jury from the relevant science or art branch, along with two substitute members. The principal and alternate members of the associate professorship examination jury evaluate the candidate's publications and studies, and submit detailed and reasoned reports to the Interuniversity Board. The title of associate professor is awarded to candidates deemed to have sufficient publications and studies by the Interuniversity Board. However, possessing the title does not guarantee a position. The criteria for the title of associate professor are the same across all universities.²
- *Associate professorship position* Individuals holding the title of associate professor can apply for associate professor positions announced by higher education institutions. To evaluate the candidates for the associate professor position, three professors, including the head of the relevant department and at least one external professor, are appointed by the rector. Each professor writes a separate report for each candidate and, if there are multiple candidates for the position, they express their preferences. The rector makes the appointment based on the decision taken by the university's board of directors or the high technology institute, considering these reports. The position offers a permanent contract. Each university has their own publicly available tenure criteria.³
- *Professorship* Academics who have worked for at least five years after obtaining the title of associate professor and meet the promotion criteria set by institution can apply for professorship positions announced by higher education institutions. The applications are evaluated by five professors working in the same field, and if successful, the candidate is awarded the professor position. This position provides a permanent appointment until retirement.

Incentive system

Two incentive systems are implemented in Turkey, which are as follows:

- *TÜBİTAK Incentive Program for International Scientific Publications* This program involves monetary support provided by TÜBİTAK (the Scientific and Technological

² The criteria for associate professorship title is accessible on this website: <https://www.uak.gov.tr/Sayfalar/docentlik/basvuru-sartlari/2023/2023-mart-donemi-docentlik-basvuru-sartlari.aspx>

³ One example of criteria can be found here (Hacettepe University's criteria): https://www.hacettepe.edu.tr/fs/atama/SFMSMH_KRITERLERI_Ekim_2022.pdf

Research Council of Turkey), the main funding agency in Turkey, since 1993. Its primary objective is to increase the number of publications indexed in the Web of Science. The level of scientific journals is determined based on metrics such as journal impact factor and article influence score.⁴ The funding allocated to each journal is announced annually on the TUBITAK website. Academics who publish in these journals receive incentives. However, studies indicate that this incentive system is not equitable across all fields (Taşkın, 2020). The journal list is heavily based on metrics (Kulczycki et al., 2022b, 2022b), which may not necessarily contribute to an increase in the number of publications (Tonta, 2017) or the citation impact (Tonta & Akbulut, 2020).

- *Academic incentive allowance regulation* The purpose of this regulation is to provide a salary bonus to academics employed in state universities for their scientific activities conducted in the previous year, such as publications, books, research, projects, patents, etc. A maximum score is assigned for each activity, and the ranking of journals is determined based on indexes, quartiles, or national/international standing. The bonus amount is determined according to the hierarchical position and added to the monthly salary. Since the criteria for this incentive, which has been in effect since 2015, are updated nearly every year, there is a lack of scientific studies evaluating the effectiveness of the system.⁵

The most significant aspect of the research evaluation system in Turkey is its reliance on metric-based criteria. This approach motivates researchers to publish rapidly and accumulate points quickly, often prioritizing speed over quality. However, when combined with the lack of clear conceptualization of certain key concepts within the system, such as national publishers, books, book chapters, and international publications, it has led to an overwhelming mass of publications that often go unread. Therefore, understanding the implications of metric-based evaluation systems is crucial in order to effectively combat questionable publishing practices.

Data and methods

In this section of the study, we provide a detailed explanation of the data collection methods and techniques employed. The process of the study and the various stages of data collection are presented in Fig. 2.

Initial data and identification of questionable journals

The primary data for this research comprises 398 scholars who authored 417 questionable articles from Turkey, utilizing data from the study conducted by Kulczycki et al. (2021). It is crucial to comprehend the data collection methods and techniques employed in the referenced study. The study encompasses 3,234 questionable articles published in social science journals between 2012 and 2018, along with 5964 articles that cite them. The process of

⁴ Journal lists by year: <https://cabim.ulakbim.gov.tr/ubyt/>

⁵ Criteria of 2023 is available at: <https://www.mevzuat.gov.tr/anasayfa/MevzuatFihristDetayIframe?MevzuatTur=21&MevzuatNo=201811834&MevzuatTertip=5>

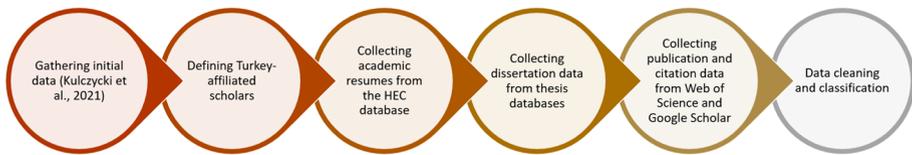


Fig. 2 Data collection process of the study

creating the questionable journal dataset for social sciences in the previous study is outlined as follows:

- *First step* Selecting 37 social sciences journals from among 1,310 journals in Beall’s list,
- *Second step* Selecting 37 social sciences journals from among 10,496 journals in Cabell’s list,
- *Third step* Cross-checking the lists and defining 74 unique questionable journals for social sciences.

Despite the ongoing debate on questionable publishing covering issues related to predatory journal lists, ‘grey publishing’ indicating publications not in questionable journals but of low quality, and the role of big commercial publishers in this matter (Nicholas et al., 2023; Oviedo-García, 2021), it is important to note that the initial data of this study is derived solely from Beall’s and Cabell’s lists. This constitutes the primary limitation of our study, and it is imperative to acknowledge this aspect.

Data collection

To investigate the motivators of publication in questionable journals for Turkey, we focused solely on information from Turkey-affiliated scholars. Therefore, information for 513 Turkey-affiliated authors was obtained from 3234 questionable journal articles. Then, we searched all researchers from a publicly accessible database containing details of all academics actively working in Turkey.⁶ Academics who could not be found in this database due to retirement, leaving the institution, or other reasons were excluded from the dataset. As a result, the final dataset included 398 researchers who authored 417 articles published in questionable journals within the field of social sciences.

All information regarding the ORCID, academic titles, and the years they obtained these titles, as well as the dates of their master’s and doctorate degrees, their disciplines, the names of their institutions, and other collaborative institutions of the researchers included in the study, were collected by examining the HEC’s database. The decision to use the HEC’s database as the main source was based on the fact that applications for associate professorship title and the Academic Incentive Allowance Regulation are made through this platform. However, some deficiencies/errors in the information about certain

⁶ The database is provided by the HEC of Turkey: <https://akademik.yok.gov.tr/AkademikArama/> Information for all academics working in Turkey is available in this database. Moreover, since the system is used by all academics who wish to apply for associate professorship or the Academic Incentive Allowance Regulation, academics’ resumes are generally kept up-to-date.

⁷ Searches were conducted between 20.09.2022 and 05.10.2022.

academics in the database were observed. To minimize these errors, various platforms such as university department pages, institutional profile pages, LinkedIn, and social media accounts of the authors were used during the verification of the author's data. The master's and doctorate years in the database were confirmed by the HEC thesis archive.⁸ In cases where the master's and doctorate years differed between the two platforms, the full texts of the thesis in the HEC Thesis Archive and the authors' profiles on the university's website were examined and verified.

Web of Science and Google Scholar queries were employed to determine the publication and citation profiles of the authors. The years of publication in questionable journals were considered as milestones, and all previous and subsequent statistical data were recorded in the data file. The searches were conducted between 20.09.2022 and 05.10.2022, and publications and citations after this date were not included in the evaluation. Information about the citations received by the questionable publications was also obtained from the Google Scholar during the same period.

Analysis

Since the main research question in this study was structured to understand the preference of researchers for questionable publications, the majority of the analyses were based on the date of the questionable publication. In other words, the analyses include statistics before and after the publication. Therefore, as academics with more than one publication in questionable journals were evaluated separately, 417 articles were accepted as the analysis units, not 398 individual authors in Figs. 5, 6 and Table 1.

The graphs (pie and stacked bar graph) in Fig. 3 and the scatterplot presented in Fig. 5 were created with the help of Excel, and the Adobe Photoshop CS6 program was used to improve readability. Figures 4, 6, and 7 were created using Flourish,⁹ an online visualization tool, with the Sankey and stacked bar chart features. For the mappings in Fig. 3, the Statplanet¹⁰ software was used. The geographical data in these images represent the cities where the authors work. In the analysis carried out to find the relationship between the foundation year of the university in the same department and the number of publications in questionable journals, HEC's official data¹¹ were used for the total number of researchers, the year of establishment, and the location of the universities.

Since the data did not show a normal distribution, Spearman's Rho correlation test was applied to determine the correlation between the age of the institution and the number of publications in questionable journals. To understand whether there is a difference according to titles in the case of sharing the questionable publications in the HEC profiles, the chi-square test was carried out on the classified data. *Cramer's V* value was also included in the test results to present the effect size in the chi-square test. The Mann–Whitney U test was used to determine the relationship between the type of institution and the number of publications in questionable journals, while the Kruskal–Wallis test was applied to determine the relationship between the age group of the institution and the number of publications in questionable journals per academics. All statistical tests were conducted using IBM SPSS 23 software.

⁸ <https://tez.yok.gov.tr/>

⁹ Flourish: <https://flourish.studio/>

¹⁰ Statsilk – Statplanet: <https://www.statsilk.com/software/statplanet>

¹¹ <https://istatistik.yok.gov.tr/>

Findings

Descriptive statistics

Within the scope of this study, the academic careers of 398 academics from Turkey, who published in questionable journals between 2012 and 2018, were comprehensively analyzed. All of these authors have a profile in the HEC's database as of October 2022, indicating their employment as academics within the Turkish higher education system. In other words, they are researchers who fall under the group affected by academic performance evaluation systems. Descriptive statistics for the academics comprising the dataset are presented in Fig. 3.

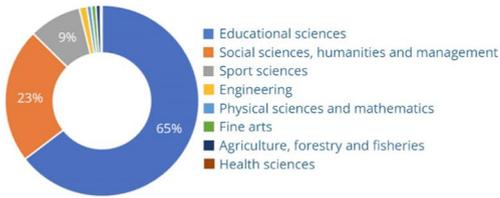
Although the article from which the data used in this study was taken focused only on social sciences journals (Kulczycki et al., 2021), examining the names of Turkish academics working in the field of pure sciences (See Fig. 3a) confirms the frequently claimed "interdisciplinary" nature of questionable journals. Previous studies on questionable publishing have revealed a demand for such journals in various fields, including health sciences, humanities, and technology (McLeod et al., 2018, p. 122). The findings obtained within the scope of this study support this observation.

While it is recognized that awareness of questionable journals is low among young researchers, it is noteworthy that 81% of the authors examined in this study are professors and associate professors. Considering that the articles were published between 2012 and 2018, it is crucial to understand during which period of their academic careers these authors published questionable publications. On the other hand, it is not surprising that publications in questionable journals are prominent at the top of the academic career ladder, as existing literature indicates that those who publish in questionable journals do so deliberately (Mutlu, 2020). The rapid availability of an associate professorship application after completing the doctorate, the publication-oriented criteria, and the academic incentive allowance applied in state universities might play essential roles in driving this conscious choice.

It was found that 91% of the authors in the analyzed group were affiliated with state universities, while 9% were affiliated with foundation universities. In Turkey, there are a total of 205 universities, with 127 (62%) being state institutions and 78 (38%) being foundation institutions. On the other hand, when we consider the number of academics in the higher education system, 92% of them work at state universities and 8% at foundation universities. Comparing these percentages, it can be concluded that there is no significant difference between institutions in terms of their interest in publishing in questionable journals. The results of the Mann–Whitney U test, conducted to determine the difference between the type of institution and the number of publications in questionable journals per academic, confirm this finding. There was no significant difference between the two groups ($p=0.930$). Despite foundation institutions having a distinct organizational structure, with a board of trustees that holds decision-making authority in personnel assignments, promotions, and academic incentives, it appears that this does not significantly impact the choice of journals. However, it is essential to conduct a more in-depth examination to ascertain if other factors, such as the university's foundation year or size, may underlie this preference.

When considering academics based on their domestic and international external experiences, another striking result emerged. Approximately 80% of the academics solely had affiliations with domestic institutions, while the remaining 20% had connections with foreign institutions. Existing literature has shown that individuals with international experience at the graduate or higher academic level are less likely to publish in questionable

a) Disciplines



b) Titles



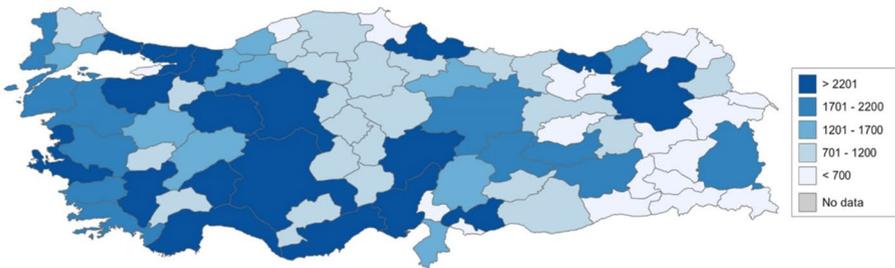
c) Institution type



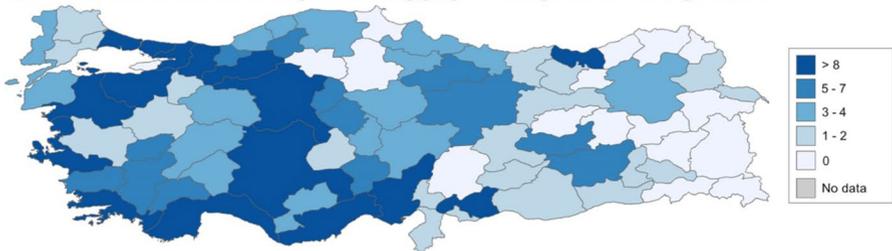
d) External experience



e) Distribution of scholars to cities



f) Distribution of scholars publishing papers in questionable journals



g) Questionable articles per scholars

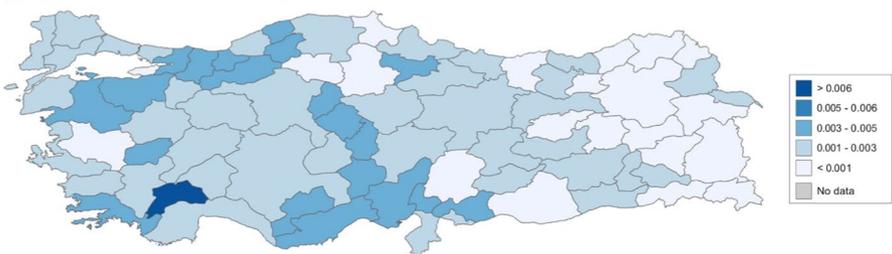


Fig. 3 Descriptive statistics

journals, and this study's findings support that notion. The data revealed that academics with connections to foreign institutions were more inclined to avoid questionable journals (Mertkan et al., 2021, p. 478; Perlin et al., 2018, p. 269).

In the last 20 years, Turkey has seen the establishment of many rural universities. Some studies suggest that these rural universities might devalue scientific activities (Gözler, 2019). To investigate the validity of the claim regarding the “devaluation of scientific activities” associated with rural universities in Turkey, an analysis was conducted (See Fig. 3e–g). The figures reveal a parallel relationship between the total number of academics among provinces and the number of academics publishing in questionable journals. Moreover, the Spearman correlation test results between the total number of academics and the number of publications in questionable journals confirm a positive relationship at the 95% confidence level ($r^2=0.562$, $p<0.001$). In essence, as the number of academics increases, there is a proportional rise in the preference for questionable journals. Notably, seven cities (Burdur, Bolu, Uşak, Niğde, Amasya, Kırşehir, and Mersin) stand out, exhibiting a questionable publication rate of up to 0.005 per scholar. The variance in this rate may be attributed to the foundational years of the respective universities. To delve further into this matter, an additional analysis was performed, considering the foundation years of universities. The relationship between the foundation years of universities and the number of publications in questionable journals showed a weaker correlation ($r^2=0.210$, $p<0.001$). Figure 4 demonstrates the connection between the age of universities and the types of institutions concerning the number of questionable articles per academic. It is evident from Fig. 4 that closer attention is required for universities established within the last 20 years.

In Fig. 4, it is noteworthy that the number of questionable publications per academic is high in universities established in the last 20 years. This may indicate the pressure for publication in newly established universities. While the preference for questionable journals is higher in foundation institutions aged 5–10 years, this phenomenon is less observed in more established institutions. However, Kruskal Wallis test results reveal that there is no significant difference between the age of the institution and the number of publications in questionable journals per academician ($p=0.016$). The fact that questionable journals are preferred even in well-established state universities should be evaluated, and performance evaluation systems should be reviewed. Considering the data, it is evident that the problem does not arise solely from rural or newly established universities. The presence of academics who prefer questionable journals for publication in well-established state universities, where many academics work, necessitates a holistic solution.

The effect of career stages on questionable journal preferences

The main research question of this study is to investigate the potential impact of academic performance evaluation systems on questionable journal preferences. Establishing a connection between these two factors could lead to improvements in research performance evaluation systems and address issues related to publishing in questionable journals. To address this, we evaluated the academic levels of the authors of the 417 articles included in the study, and the findings are presented in Fig. 4. In Fig. 4, the x-axis represents the authors of the 417 publications, and important points in their academic career paths are marked. The zero point on the x-axis represents the year of publication in the questionable journal.

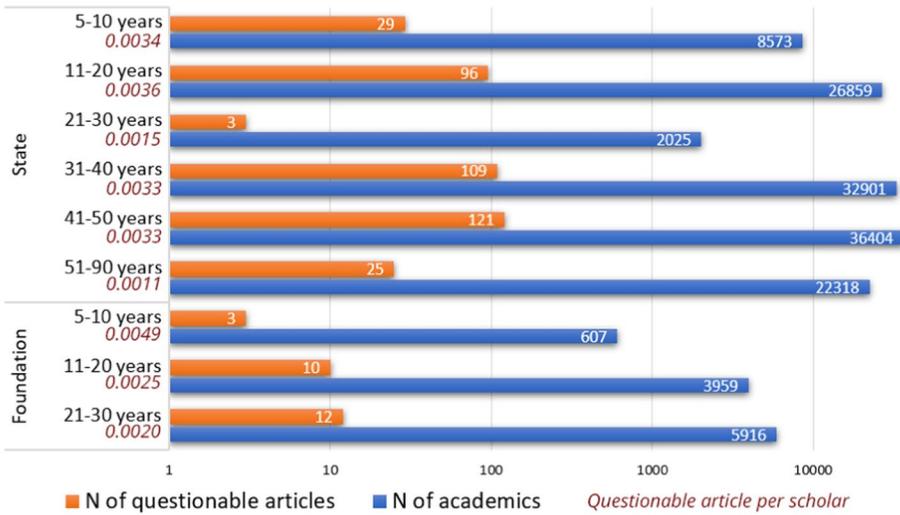


Fig. 4 Number of questionable publications per academics by university type and age

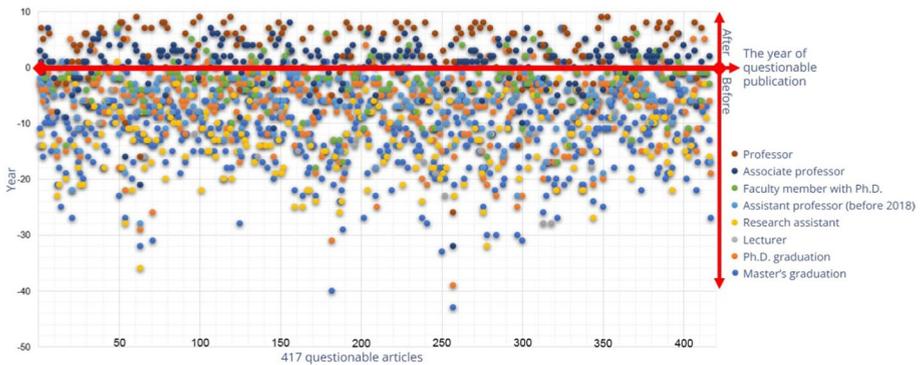


Fig. 5 Academic career development of the authors of 417 Turkey-addressed articles published in questionable journals

Table 1 Academic career milestones and year differences between questionable publication

	Master's	Ph.D	Lect	Res. Asst	Assis. Prof	Fac. Mem. Ph.D	Assoc. Prof	Prof
N*	410	408	27	208	207	155	237	125
Mean year	- 12	- 6	- 13	- 13	- 6	- 3	0.6	4
Median year	- 12	- 5	- 13	- 13	- 5	- 2	2	6

* The row shows how many academics the relevant title or degree is valid for

In Fig. 5, the red line represents the publication year in the questionable journal, while each point represents a milestone in the academic career of the respective researcher. Observing this image, it becomes evident that the majority of the academics (indicated

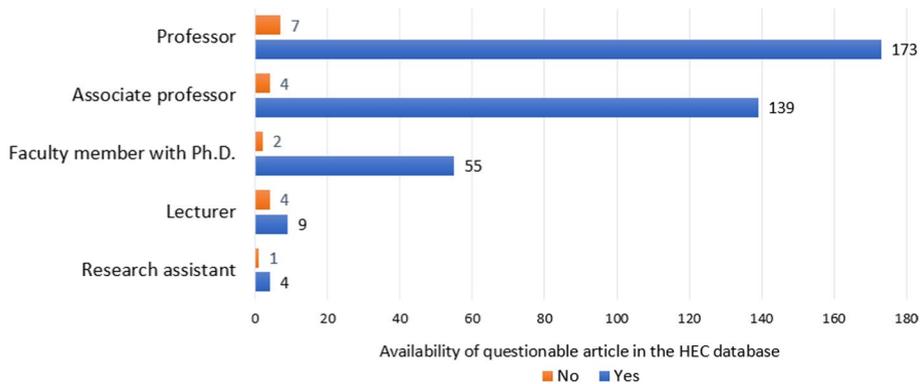


Fig. 6 Availability of questionable article in the HEC database and its distribution to academic titles

by the dark blue dots located just above the red line) published in the questionable journal before achieving the associate professorship status. This trend is further highlighted in Table 1, where it was revealed that the time elapsed between publishing in the questionable journal and obtaining associate professorship was less than a year, while the duration between publication and professorship initiation was around four years. This finding suggests that researchers tended to publish a questionable article just before applying for associate professorship.

The use of the articles published in questionable journals in promotion or incentive portfolios

Another significant objective of this study is to investigate whether academics include publications in questionable journals in their academic promotion or incentive portfolios. While academic promotion files are typically confidential due to containing personal information, the availability of both academic incentive and associate professorship title applications through HEC’s database facilitated data collection. If a publication is present in the database, it may indicate that the author included it in their applications.¹²

As a result, it was found that 96% of the articles published in questionable journals were listed in the academics’ profiles on the database (see Fig. 6). Furthermore, when analyzing whether this trend differed according to academic titles, it was determined that there was a significant difference ($\chi^2(4) = 26.267, p < 0.001, V = 0.251$).

Additional analysis: publication and citation patterns of authors

Given the prevailing acceptance of Web of Science as a legitimate and reliable tool for research evaluation in Turkey, we examined the number of Web of Science indexed publications of authors who published questionable articles before and after their involvement with

¹² The query was conducted in October 2022. Since academics have the right to modify their HEC profiles, they may remove these publications from their profiles after the promotion or evaluation period has passed.

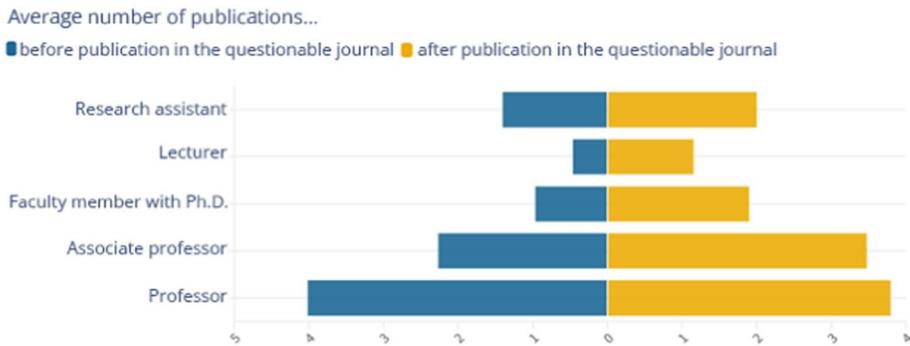


Fig. 7 Average number of publications with WoS before and after publication in the questionable journal (all WoS indexes included SCI, SSCI, AHCI, ESCI)

questionable journals (see Fig. 7). To accomplish this, we divided each author’s career into two segments: the period before and after their publications in questionable journals. Subsequently, the number of publications in each of these segments was evaluated independently.

As illustrated in Fig. 7, there is no significant difference in the number of WoS indexed publications before and after the questionable publications for professors. Notably, a discernible difference exists in the average number of publications across other academic titles. However, it is crucial to recognize that the observed variance can primarily be attributed to the cumulative nature of scientific careers and the distinct stages therein. Direct comparisons are limited by the duration of academic careers; nevertheless, it is essential to acknowledge the publication pressure on positions before professorship. As researchers progress through academic ranks, the number of publications and citations typically rises concurrently. For a more detailed breakdown of the distribution of academic publication and citation averages based on researchers’ titles, refer to Table 2.

Although questionable journals can sometimes be included in the WoS or Scopus indexes, it is crucial to recognize that both indexes adhere to specific criteria for journal selection.¹³ The observed rise in the number of WoS-indexed publications after the publication of questionable articles, particularly among associate professors and before, may be indicative of alterations in the journal selection criteria during a period of reduced publication pressure. However, additional in-depth analyses are necessary to validate this hypothesis.

In their studies, Kulczycki et al. (2021) and Taşkın et al. (2023) asserted that articles published in questionable journals were cited by reputable journals, and they provided evidence to support this assertion. To examine whether this claim holds true for authors from Turkey, each publication from questionable journals was searched in Google Scholar, and the results are displayed in Fig. 8.

Despite significant numerical differences between disciplines, articles published in questionable journals receive a substantial number of citations, which is a topic widely discussed in the literature. Various debates (Anderson, 2019; Björk et al., 2020; Frandsen, 2017; Taşkın et al., 2023) question whether citations accurately measure the quality of publications, and this study adds to the ongoing discourse. Notably, the data source used in this study is Google Scholar, which covers a wide range of content, yet these articles labeled as

¹³ <https://clarivate.com/products/scientific-and-academic-research/research-discovery-and-workflow-solutions/web-of-science/core-collection/editorial-selection-process/> | <https://www.elsevier.com/solutions/scopus/how-scopus-works/content/content-policy-and-selection>

Table 2 The average number of publications and citations of academics who have publications in questionable journals regarding academic titles

Title	Average number of publications in WoS core indexes (SCI, SSCI, AHCI)	Average number of publications in all indexes (with ESCI)	Average number of citations
Professor	4.0	7.8	46.5
Associate professor	2.8	5.7	31.6
Faculty member with Ph.D	1.0	2.9	15.2
Research assistant	1.6	3.4	5.2
Lecturer	0.5	1.6	2.5

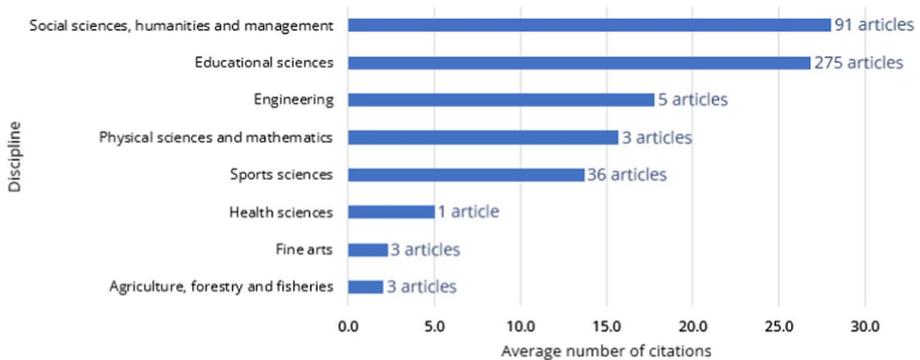


Fig. 8 Average number of citations on Google Scholar of articles in the questionable journals

questionable continue to receive considerable citations. Conducting a detailed analysis of these citations could provide valuable insights into the actual impact and contribution of these publications to the academic literature.

Discussion

The discourse on questionable publishing, initially propelled by Beall’s lists, has recently gained momentum with the emergence of analogous lists from private entities like Cabell’s. This subject has been extensively explored in scientific literature, with numerous studies investigating researchers’ predilection for questionable journals through qualitative data and analysis, striving to comprehend the underlying motivations. Throughout these inquiries, a recurring theme centers on the influence of academic performance systems, including incentive and promotion structures. The validation of this influence through empirical data becomes paramount for the implementation of effective measures.

Our study sought to delve into the impact of current academic performance evaluation systems on the publication preferences of academics in Turkey. Drawing on the extensive research conducted by (Kulczycki et al., 2021) on questionable journals, we utilized their dataset as a foundational basis for our investigation, recognizing it as one of the most comprehensive and relevant studies in recent times.

The findings of our study reveal a discernible impact of current research evaluation systems on the journal selection preferences of researchers in Turkey, particularly during the associate professorship application process. This effect was consistently observed among the 398 individual authors included in this study. Notably, no discernible patterns emerged in terms of the type or age of institutions concerning researchers' questionable publication preferences. Although universities established in the last 20 years exhibited a higher prevalence of publications in questionable journals, a similar issue was observed in well-established universities. This observation underscores the imperative of devising a comprehensive approach to address and rectify this issue on a broader scale.

The results also highlight a significant presence of questionable publications listed in researchers' academic profiles, suggesting that such publications are utilized in applications for academic incentives and associate professorship. Furthermore, our analysis indicates that scholars with affiliations to foreign institutions show a lower inclination to publish in questionable journals, providing a nuanced perspective to the ongoing discussion.

An intriguing observation surfaced concerning the citation rates of articles published in questionable journals. Despite the ongoing controversies and debates surrounding citations as a measure of publication quality, these articles garnered substantial citations, signifying a noteworthy impact on the scholarly community. A more in-depth exploration of these citations may yield valuable insights into the actual contribution of such publications to the academic literature.

Conclusion

Our study illuminates the substantial influence of current academic performance evaluation systems on shaping researchers' preferences for questionable journals. Despite the absence of discernible patterns related to the type and age of institutions, our findings reveal a disconcerting tendency among both newly established and well-established universities towards publishing in questionable journals. These results highlight the pressing need for a comprehensive and unified approach to address this issue and enhance research evaluation practices in the academic realm. This urgency is particularly pronounced for peripheral countries striving to establish a foothold in the current scientific ecosystem, allocating significant resources towards this goal. Our study underscores the imperative for targeted interventions and reform to ensure a more transparent, rigorous, and ethically sound academic publishing landscape, fostering a culture that values quality research over sheer quantity.

Future studies

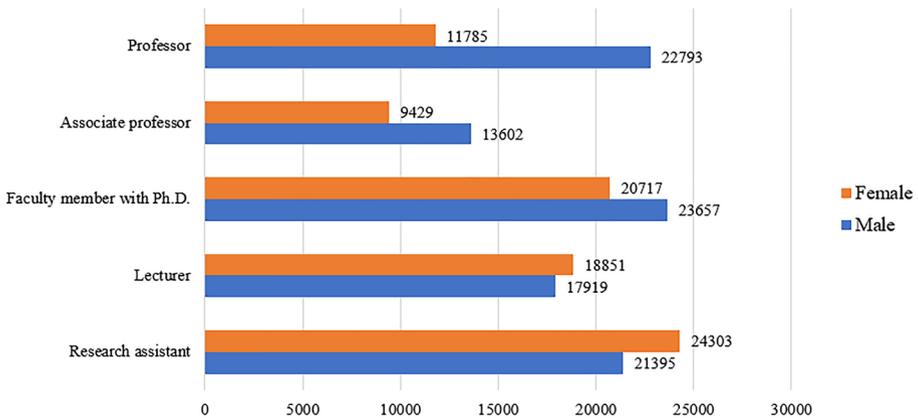
While this study sheds light on the impact of current academic performance evaluation systems on scholars' questionable journal preferences in Turkey, there remain important avenues for further research. First, conducting qualitative analyses to delve deeper into the real motivators and pressures faced by scholars in their publication choices could offer valuable insights. Understanding the underlying factors that drive researchers to opt for questionable journals will aid in devising targeted interventions and policy adjustments to address the root causes of this issue.

Additionally, extending this investigation to a cross-national study encompassing multiple countries can provide a more comprehensive and international perspective. Comparing and contrasting the publication practices and preferences across diverse academic systems will offer a nuanced understanding of how different contexts influence researchers' choices. Such a comparative approach can lead to the formulation of more universally applicable solutions to combat questionable publishing practices and promote integrity in academic research globally. By engaging scholars from various regions, this cross-national study can offer a more holistic understanding of the cultural, institutional, and disciplinary variations that shape researchers' journal selection behaviors.

Overall, combining qualitative analysis with cross-national studies will strengthen our knowledge base on questionable publishing practices and contribute to the development of effective and tailored strategies to address this pressing issue. A multi-dimensional exploration of scholars' motivations and preferences will be instrumental in fostering a scholarly ecosystem that upholds high standards of research integrity, transparency, and credibility across academic communities worldwide.

Appendix 1

The distribution of researchers to the academic titles in Turkey (Datasource: <https://istatistik.yok.gov.tr/>, downloaded in 14.07.2023).



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Author contributions OÖ: Conceptualization, methodology, data curation, data cleaning, visualization, formal analysis, writing—original draft, writing—review & editing. ZT: Conceptualization, methodology, visualization, formal analysis, writing—original draft, writing—review & editing.

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Declarations

Conflict of interest The authors have declared no conflict of interest.

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