



Who gets retracted? Gendered patterns in academic article retractions in Indonesia

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Abstract

Introduction. Scopus-indexed publications are key indicators of academic prestige, career advancement, and financial rewards in Indonesia. However, the rapid expansion of publication output driven by performance-based policies has raised concerns about research integrity and misconduct. Retraction cases offer a useful lens for examining these dynamics. This study explores gender-related patterns in retractions team composition and causes of retraction.

Method. This study analyzed 196 retracted articles by Indonesian scholars and indexed in Scopus between 2017 and 2024. Data were obtained from the Retraction Watch Database (retrieved March 20, 2025). Author gender composition was classified gender-related patterns of retraction.

Analysis. Pearson's chi-square tests assessed the pattern between gender composition and four variables: reason for retraction, publisher type, article category, and disciplinary field.

Results. The analysis identified patterns in retracted publications across different gender compositions. Differences in the reasons for retraction indicate tendencies in research and publication practices. These findings offer a descriptive account of how team composition may correspond with retraction patterns.

Conclusion. This study examines gendered retraction patterns in the Global South within broader academic practices, not merely as indicators of wrongdoing. Understanding these patterns may encourage more nuanced reflections on research quality, accountability, and scholarly performance.

Introduction

In Indonesia, publication in Scopus-indexed journals is both a prerequisite for academic advancement and a significant factor influencing monetary rewards. This performance-oriented approach has intensified the pressure on researchers to publish swiftly and frequently, often prioritizing quantity over quality. Consequently, publication outputs from Indonesian institutions have increased significantly in recent years (Fry et al., 2023; Irawan et al., 2023; Macháček & Srholec, 2022), alongside greater familiarity with bibliometric systems and their role in academic evaluation (Ahmar et al., 2018).

Research performance assessment systems that utilize bibliometric indicators, such as citation counts, Journal Impact Factor (JIF) values, and journal quartiles, have been extensively implemented across national and institutional contexts. In the Global North, for example, such systems are evident in Russia through its 5–100 HSE program (Moed et al., 2018); in Italy through the Valutazione della Qualità della Ricerca (VQR) framework (Abramo & D'Angelo, 2015); and in the United Kingdom through the Research Excellence Framework (REF) (Pinar & Horne, 2022). Comparable approaches have also been adopted in the Global South, including in Chile (Troncoso et al., 2022); Indonesia (Minister of Research, Technology, and Higher Education, 2017); and Brazil through the Coordination for the Improvement of Higher Education Personnel (CAPES) system (Almeida, 2025). Since the 1990s, numerous universities in China have adopted indexed publication indicators, such as those from the Science Citation Index (SCI) or Web of Science (WoS), along with journal impact factors, as essential components in evaluating academic performance and career advancement (Zhao et al., 2025).

Governments and institutions adopt these metrics to align research productivity with national development goals and institutional rankings (Bartol et al., 2014; Zhang & Siversten, 2023). In Indonesia, such policies have fostered greater international collaboration among researchers (Maryono & Surajiman, 2017). However, the same bibliometric emphasis has raised concerns about its limitations and unintended consequences, including ethical breaches and scientific misconduct (Hicks et al., 2015; Rousseau et al., 2018). Although this study focuses on Indonesia, its significance extends beyond national boundaries. Indonesia is one of the largest and fastest-growing research systems in the Global South, operating under a distinctive policy framework that ties academic promotion and research funding directly to Scopus-indexed publications. This combination of rapid bibliometric growth, performance-based incentives, and evolving research governance offers a valuable comparative lens for understanding how similar pressures operate in other emerging knowledge economies.

Indonesia's policy framework is reinforced by national regulations, such as the Minister of Research, Technology, and Higher Education's Regulation No. 20/2017 and subsequent decrees, which formalize lecturer evaluation and academic promotion requirements. Universities implement performance contracts that offer cash bonuses, additional research grants, accelerated promotion, and reduced teaching loads, while missed targets can delay promotion or limit access to competitive research funding. While such schemes are intended to enhance global visibility, they may exacerbate the systemic pressures that affect research integrity.

In a publish-or-perish climate, the urgency to meet institutional benchmarks can undermine ethical behaviour. Ethical violations, including plagiarism, data fabrication, duplicate publication, and authorship disputes, are increasingly documented, contributing to the rising number of article retractions (Maddi et al., 2025; Zhang et al., 2019; Zheng & Fu, 2024). While global studies have examined gendered dynamics in authorship and misconduct, limited research has explored how gender hierarchies shape retraction outcomes in the Global South, especially in high-pressure environments such as Indonesia. Prior Indonesian scholarship (Al-Fatih, 2025; Agusta et al., 2025; Susilowati et al., 2023) has highlighted the interplay between gender, ethics, and systemic challenges, but empirical large-scale analyses remain scarce.

This study addresses this gap by examining retracted publications authored by Indonesian scholars in Scopus-indexed journals between 2017 and 2024, a period of heightened incentives for international publication driven by national faculty performance evaluations, institutional assessments, and the broader agenda of university internationalization. Using data from the Retraction Watch Database, we investigated the retraction pattern across gender composition of author teams and four critical variables: disciplinary field, article type, publisher, and stated retraction reason.

Consequently, we have four research questions:

1. Is there a discernible pattern between the gender composition of authors and disciplinary subjects?
2. Is there a pattern between the author's gender composition and article type?
3. Is there a pattern between the author's gender composition and publisher type?
4. Is there a pattern between the author's gender composition and the categories of retraction reasons?

While both national context and gender are integral to this study, the primary contribution is the examination of gendered retraction patterns within Indonesia's distinctive policy and institutional frameworks. By situating gender analysis within a nation experiencing rapid bibliometric reform, this study connects micro-level authorship dynamics with macro-level policy environments, providing valuable insights for policymakers, journal editors, and integrity scholars worldwide.

Related work

Research performance assessment policy in Indonesia

Post-1998 reform, Indonesia started a new phase in various fields, among them the policy for advancing science and technology. Putera and Jannah (2012) analyzed the national science policy and concluded that the 2000–2011 period did not sufficiently support research advancement. In response, the government enacted Law No. 11/2019 on the National Science and Technology System, aimed at accelerating research ecosystem development through the creation of the National Research and Innovation Agency (BRIN) and broader reforms in governance, funding, and cross-sector coordination (Burhaniet al., 2021; Indonesia 2019).

Over the past decade, Scopus-indexed publications have become the primary marker of scholarly status in Indonesia, shaping promotion decisions and publication-linked incentives (Minister of Research, Technology and Higher Education, 2017). This emphasis is national in scope and formalized through Ministry regulations on lecturer evaluation and promotion (Minister of Research, Technology, and Higher Education, 2017; Ministry of Higher Education, Science, and Technology, 2025). The promotion criteria specify minimum publication thresholds. For example, eligibility for promotion to Associate Professor includes at least one Scopus-indexed article as the first author in a reputable international journal, while Full Professor promotion adds journal-metric thresholds (e.g., SJR or JIF cut-offs). In practice, these rules are often operationalized through annual output targets and incentive schemes, which have attracted criticism for amplifying publication pressure amid uneven resources and oversight.

Scopus remains the most preferred indexing database among Indonesian researchers (Nasution, 2023), prompting targeted training initiatives to improve their publication skills (Febrian et al., 2024; Nanere et al., 2025; Susanti et al., 2025; Syairofi & Irawan, 2025). Academic writing is also shaped by competition for recognition (what Merton (1973) called 'credit') as a form of symbolic capital that influences career progression, professional reputation, and access to resources. While Fry et al. (2023) suggest such policies can boost productivity and capacity in low- and middle-income countries, critics highlight potential downsides. For instance, Suyitno (2023) refers to high-

output academics as ‘servants and worshippers of Scopus’. In Russia, Lavakov and Teixeira da Silva (2025) observed that performance metrics heightened institutional pressure and undermined research integrity, a concern relevant to Indonesia.

To address these challenges, Al-Fatih (2025) recommends reforming faculty evaluation to be more inclusive, strengthening research integrity, and providing curated lists of reputable publishers. Conversely, Irawan et al. (2023) call for a shift in focus away from metrics toward maintaining research integrity and aligning funding with national priorities.

This study also draws on recent Indonesian scholarship on academic misconduct and ethics. Susilowati et al. (2023) analyse generational and gender perspectives on misconduct, revealing nuanced attitudes toward plagiarism and compliance. Al-Fatih (2025) warns of declining publication standards under current incentive systems. Agusta et al. (2025) review ethical principles and common forms of misconduct, offering a conceptual foundation for understanding integrity challenges. Together, these studies reinforce the need to examine retraction patterns from both gender and policy perspectives.

The issue of article retraction

Prominent retraction cases in Indonesia have drawn public attention to research ethics and editorial responsibilities. One high-profile example was the withdrawal of a manuscript on the Gunung Padang archaeological site in Cianjur, which attracted intense discussion on social media because of its controversial claims about prehistoric chronology (Retraction Watch, 2024a; Tempo, 2024a). In another case, an economics professor at a private university was found guilty of academic misconduct while attempting to boost Scopus-indexed output, resulting in dismissal from the deanship, revocation of the professorship, and multiple retractions (Retraction Watch, 2024b; Tempo, 2024b). These cases highlight both the growing awareness of academic malfeasance and the fragile oversight mechanisms governing Indonesian research.

Retraction serves as a corrective measure, but it often reflects deeper systemic deficiencies, including institutional pressure, ethical breaches, and inadequate editorial oversight. The Committee on Publication Ethics (COPE) stresses that retractions are essential for preserving the scholarly record when research is deemed to be unreliable (COPE Council, 2019). Prior research has examined various aspects of retraction, including the mitigating effect of international collaboration (Zhang et al., 2019), the higher occurrence of retractions in gold open-access journals (Zheng & Fu, 2024), and disciplinary differences (Grieneisen & Zhang, 2012). Fanelli et al. (2015) further argue that institutional culture, financial incentives, and national regulatory frameworks must be considered in understanding retraction patterns. However, as Shorlec (2024) notes, this process can involve disputes between authors and editors without independent review, underscoring its procedural limitations.

Studies on gender and retraction have shown mixed results. Fanelli et al. (2015) observed that men are more frequently linked to retracted papers in absolute numbers, largely due to their over-representation in senior academic roles, yet the reputational damage from retraction may disproportionately affect women. Zheng et al. (2025) found that male first authors were more often implicated in misconduct-related retractions, such as plagiarism and authorship conflicts. Decullier and Maisonneuve (2021) reported that 59.2% of retractions involved male authors, compared to 28.6% involving female authors, with distinct patterns of error between the genders. Li et al. (2023) showed that cultural and policy environments shape gender disparities in retraction outcomes. Similarly, Pinho-Gomes et al. (2023) reported that 60.9% of retracted articles had male first and last authors, while Sebo et al. (2023) found women underrepresented among retracted medical publications. Ribeiro et al. (2023) highlighted that women accounted for only about 25% of self-retractions, suggesting fewer voluntary withdrawals for honest error among female scientists.

Large-scale analyses have also revealed recurring structural patterns. Maddi et al. (2025) noted that retracted works often appear in high-impact or open-access journals, are produced by medium-sized teams (three to ten authors), and are concentrated in health and life sciences. In contrast, multinational collaborations and project-based funding show lower retraction rates. Across these contexts, gendered differences emerge: male-led teams are more often linked to ethical breaches, whereas female-led teams are more frequently associated with procedural or administrative issues. This asymmetry reflects the broader challenges of recognizing women's contributions and equitably distributing accountability.

These disparities align with the *Matilda Effect* (Rossiter, 1993), which describes the systemic undervaluation of women's scientific work. In collaborative projects, women may be excluded from leadership roles or disproportionately blamed during misconduct investigations, especially in contexts where gender equity policies are weak. Therefore, retraction-related stigma can have long-term career impacts on female researchers, who remain underrepresented in many disciplines. In Indonesia, women constitute 45.45% of lecturers nationally (Directorate General of Higher Education, Research, and Technology, 2023), but only 32.2% at Institut Teknologi Bandung (ITB), a leading STEM institution, illustrating persistent gender imbalances in high-prestige fields.

While research on retraction and gender is growing, most evidence comes from the Global North. Little is known about how gendered authorship structures interact with retraction mechanisms in the Global South, where policies, cultures, and institutional incentives differ markedly. In Indonesia, scholarly discussions on these issues remain limited, often confined to news coverage or informal commentary. This study addresses this gap through the first large-scale, data-driven analysis of gender and retraction by Indonesian academic authors. By examining the gender composition of authors across disciplines, article types, publishers, and stated retraction reasons, we highlight the intersectional factors shaping both the incidence of retraction and its reputational consequences in a performance-driven academic environment.

Methods

This study employed a quantitative secondary data analysis of the Retraction Watch Database, obtained on March 20, 2025, and cross-verified with Scimago Journal Rankings to ensure journal indexation status (The Center for Scientific Integrity, 2025). The dataset included retracted publications issued between 2017 and 2024, indexed in Scopus, authored by Indonesian researchers or collaborative teams involving Indonesian and international authors, and contained complete bibliographic information. The dates were selected to capture the effects of national lecturer and institutional performance evaluation policies that emphasize international publication output as a primary metric. Publications withdrawn before 2016 ($n = 22$) or appearing in non-Scopus-indexed journals ($n = 25$) were excluded, resulting in 196 retracted articles for further analysis. The methodological framework of this study is shaped by data availability and therefore employs absolute retraction numbers, intending to describe observed patterns rather than generate definitive comparative assessments across author types.

For each article, four categorical variables were recorded: author gender composition, primary retraction reason, disciplinary subject, publisher, and article type. Retraction reasons were coded using the nine-category taxonomy established by the Retraction Watch (see Table 1), with only the first-cited reason from the official retraction notice considered to avoid inflating category counts. Author gender was identified through a three-step process: initial classification based on common gender-specific name usage in Indonesia, verification via open sources such as Google Scholar and institutional Web pages, and targeted Web searches for ambiguous cases. In the six remaining uncertain cases, the research team reached a consensus through discussion, achieving complete agreement. This procedure follows the approach adopted by Yuret (2024) to track the careers of International Mathematics Olympiad winners.

Statistical analyses were conducted using Pearson chi-square tests of independence to examine the associations between gender composition and the four categorical variables: retraction reason, disciplinary subject, publisher and article type. Cross-tabulation matrices were generated for each test, and corrected residuals were examined when required. A significance threshold of $p < 0.05$ was applied, and linear-by-linear association statistics were used to assess ordinal trends, when appropriate. A Chi-square test was conducted to examine whether the distribution of retraction types differed significantly across the team gender compositions. To support the observed descriptive patterns, the variation was unlikely to occur by chance. This approach ensured a systematic and replicable examination of the intersection between gender dynamics and the structural or editorial factors shaping retraction patterns in Indonesia's academic publishing landscape.

Results

Distribution of retraction reasons by thematic label

The analysis revealed that the most frequent retraction cause fell under *Label 1: Investigation and computer-generated content*, which includes journal-led, institutional-led, or third party-led investigations ($n = 96$), use of paper mills, and manipulation of AI-generated content. This category's dominance signals both the persistent challenge of systemic misconduct and the emerging threat of automated content misuse in scholarly publishing.

Two other categories also featured prominently: *Label 2: Notice – limited or no information* ($n = 90$), and *Label 3: Problems with results, referencing, and attribution* ($n = 76$). Although these reflect a broad range of editorial and authorial issues, their frequency suggests that ambiguous retraction notices and technical or citation errors are common triggers for withdrawal.

For consistency with prior studies, the numerical codes in Table 1 (1–10) correspond directly to the Retraction Watch Database taxonomy rather than ranking them by frequency in our dataset. This alignment facilitates cross-study comparisons and avoids confusion when interpreting the results. Notably, *Label 9: Integrity and ethical compliance problems* was among the least reported causes ($n = 10$). While infractions in this category are serious, their low frequency may indicate underreporting or limited institutional scrutiny in cases involving Indonesian researchers.

Label no.	Category	Included retraction reasons	1	2	3	4	5	6	7	8	9	10	Totals
1	Investigation and computer-generated content	Investigations by journal, institution, or third party; paper mill involvement; AI-generated or manipulated content	5	27	24	12	1	11	8	5	2	1	96
2	Notice – limited or no information	Notice unavailable; date or notice unknown; removed; withdrawn to publish elsewhere; unclear or missing notice	40	27	19	4	0	0	0	0	0	0	90
3	Problems with results, referencing, and attribution	Issues with results, referencing, or attribution; unreliable conclusions	13	17	17	10	6	2	4	2	4	1	76

4	Authorship and affiliation problems	Authorship concerns; false authorship; lack of author approval; policy breach; unresponsive author; authorship objections	39	7	4	5	4	2	1	0	0	0	62
5	Duplication and plagiarism	Article/image duplication; euphemisms for duplication/plagiarism; text/article/data plagiarism	28	21	8	2	2	0	0	0	0	0	61
6	Error in the article	Methodological errors; conclusion/result errors; textual/image errors; journal/publisher mistakes; conference absence; retraction and replacement; third-party errors; updated corrections	41	10	7	1	0	0	0	0	0	0	59
7	Data issues	Data concerns; data errors; analysis errors; lack of approval (institution/company or third party); unavailable data	19	12	1	1	1	4	1	0	1	0	40
8	Peer review and editorial process problems	Peer review concerns; fake peer review; rogue editor	7	8	4	10	1	0	0	0	0	0	30
9	Integrity and ethical compliance problems	Missing consent; lack of IRB/IACUC approval; conflicts of interest; copyright claims; misconduct; data/image falsification; image manipulation	4	0	0	2	1	0	0	3	0	0	10

Table 1. Frequency of retraction reasons by thematic label and coding category (N = 196)

Overall, the variation across categories illustrates that retractions stem from a complex interplay of deliberate misconduct, procedural lapses, and inadequate editorial transparency. These findings reinforce the need for robust institutional ethics training, clear editorial guidelines, and regular oversight to reduce both opaque and preventable retractions in the future.

Descriptive statistics of author and publication characteristics

Table 2 summarizes the distribution of author gender composition, subject area, article type, and publisher of the 196 retracted publications analysed. The most common authorship pattern was mixed-gender teams led by men (39.8%), followed by men-only (22.4%) and mixed-gender teams led by women (22.4%). Women-only teams were uncommon (5.6%), and sole women accounted for only 2.6% of the cases. This underrepresentation mirrors broader gender imbalances in Indonesian academic publishing and suggests that women-led outputs, while fewer, may be subject to distinct retraction trends.

Retracted publications were most frequently found in Business (17.3%), other less represented or interdisciplinary areas (16.3%), and Computer science (13.8%). Disciplines such as Government and Chemistry had the fewest retractions ($\leq 3.1\%$). These differences likely reflect both variations in publication volume and differences in editorial review processes across disciplines.

Most retracted items were research articles (52.0%), followed by conference papers or abstracts (36.7%), with review articles and meta-analyses comprising less than 12%. This predominance of primary research is consistent with global retraction trends, in which methodological flaws, data issues, or ethical breaches in original studies often trigger withdrawals.

Variable	Category	Frequency	Percentage %
Gender type	Man alone	14	7.1
	Woman alone	5	2.6
	Men only	44	22.4
	Women only	11	5.6
	Men–Women (Male first)	78	39.8
	Men–Women (Female first)	44	22.4
Coding subject	Business	34	17.3
	Other (<5 papers)	32	16.3
	Computer science	27	13.8
	Biochemistry / Biology	23	11.7
	Medicine	19	9.7
	Technology	17	8.7
	Engineering	14	7.1
	Education	13	6.6
	Agriculture	6	3.1
	Chemistry	6	3.1
	Government	5	2.6
Article type	Research article	102	52.0
	Conference abstract or paper	72	36.7
	Review article	14	7.1
	Meta-analysis	8	4.1
Publisher	Other (<5 papers)	61	31.1
	IOP Publishing	54	27.6
	Elsevier	24	12.2
	Springer	16	8.2
	Hindawi	11	5.6
	MDPI	9	4.6
	Frontiers	8	4.1
	IEEE	8	4.1
	Emerald	5	2.6

Table 2. Distribution of author gender, subject area, article type, and publisher (N = 196)

Publisher data show that over half the retractions were concentrated in either IOP Publishing (27.6%) or the *Other* publisher category (31.1%), which includes multiple smaller or less internationally prominent outlets. Major publishers such as Elsevier (12.2%) and Springer (8.2%) also appeared, underscoring that retraction risk spans both large, established publishers and

smaller entities, albeit potentially through different mechanisms (e.g., procedural oversight versus volume-driven editorial pressure).

To better understand these patterns, we compared retraction proportions with the estimated overall publication output for each gender composition using Scopus metadata for Indonesian-affiliated works during the same period. This normalization allowed for the assessment of whether certain gender groups were over- or under-represented relative to their publishing volume. Where precise base-rate data could not be obtained, we refrained from making causal claims about susceptibility, in line with the reviewer's feedback to avoid unsupported interpretations.

Gender pattern across author composition and disciplinary subject

To address research question 1, we examined whether the disciplinary subject of retracted publications was associated with the gender composition of the author teams. A Pearson chi-square test using six gender categories and eleven subject areas revealed a statistically significant association ($\chi^2(50) = 72.911$, $p = 0.019$). This indicates that retraction patterns differ across disciplines depending on authorship composition.

Mixed-gender teams led by men accounted for the largest share of retractions ($n = 78$), with high representation in Biochemistry/Biology ($n = 11$) and Medicine ($n = 10$). Men-only teams were particularly common in Computer science ($n = 10$) and Engineering ($n = 5$). Mixed-gender teams led by women ($n = 44$) had a more even disciplinary spread, spanning Technology, Engineering, and Education.

Women-led authorship, whether by women-only teams ($n = 11$) or sole woman authors ($n = 5$), was rare and appeared mainly in Education and Other subjects, with minimal presence in the STEM fields. This underrepresentation may reflect gender disparities in research leadership, field participation, or visibility in retraction cases.

While these trends point to possible interactions between discipline-specific publishing norms and gendered authorship patterns, caution is warranted in their interpretation. The lower proportion of women-led teams in STEM-related retractions may signal structural inequities or differences in retraction exposure, rather than differences in research integrity itself.

The Linear-by-Linear Association test was non-significant ($p = 0.639$), which is expected given the nominal nature of the variables and does not undermine the overall chi-square result. Taken together, these findings underscore the importance of viewing retractions not only as indicators of error or misconduct but also as reflections of broader structural and demographic dimensions in Indonesia's rapidly evolving research environment.

Coding subject	Author						Total
	Man alone	Woman alone	Men only	Women only	Men-Women M first	Men-Women W first	
Business	6	1	6	1	13	7	34
Others	2	2	1	3	19	5	32
Computer science	2	0	10	0	11	4	27
Biochemistry/ Biology	0	0	6	0	11	6	23
Medicine	1	0	2	3	10	3	19
Technology	0	0	6	2	4	5	17
Engineering	1	0	5	0	2	6	14
Education	0	2	1	1	5	4	13
Agriculture	0	0	1	1	1	3	6
Chemistry	1	0	3	0	1	1	6
Government	1	0	3	0	1	0	5
Total	14	5	44	11	78	44	196

Table 3. Cross-tabulation of author gender composition by disciplinary subject in retracted publications

Pattern across author gender composition and article type

To address research question 2, we assessed whether the type of retracted article was associated with the gender composition of the author teams. A Pearson chi-square test revealed a significant association, $\chi^2(15) = 30.222$, $p = 0.011$, indicating that retraction patterns varied by authorship composition and publication format.

Retracted research articles were most frequently produced by mixed-gender teams led by men ($n = 41$) and men-only teams ($n = 24$), followed by mixed-gender teams led by women ($n = 22$). Women-led groups (whether women-only or sole woman authors) were almost absent from this category, accounting for only three articles.

Conference abstracts and papers showed a similar trend, but with an unexpectedly higher share of retractions among women-only teams ($n = 10$) than among mixed-gender teams. This may suggest disciplinary preferences for conference-based dissemination among women or particular vulnerabilities associated with this publication type. Meta-analyses, although rare in the dataset ($n = 8$), were predominantly authored by male-led mixed-gender teams ($n = 6$), suggesting a concentration of leadership in this category.

The Linear-by-Linear Association was significant ($p = 0.005$), indicating a gradient in which certain gender compositions are more frequently linked to publication types that carry greater methodological complexity or perceived prestige.

These patterns suggest that gendered authorship dynamics influence not only the disciplinary distribution of retractions (as shown in RQ1) but also the types of academic outputs that are most at risk. Male-dominant or male-led mixed teams may be more engaged in producing research-intensive outputs, increasing their visibility and exposure to retraction risk. Conversely, female-dominant teams appear under-represented in high-stakes formats, potentially due to structural

barriers, disciplinary norms, or editorial practices that shape publication opportunities and the likelihood of post-publication scrutiny.

Article type	Author						Total
	Man alone	Woman alone	Men only	Women only	Men-Women M first	Men-Women W first	
Research article	12	2	24	1	41	22	102
Conference abstract or paper	1	2	18	10	23	18	72
Review article	1	1	2	0	8	2	14
Meta-analysis	0	0	0	0	6	2	8
TOTAL	14	5	44	11	78	44	196

Table 4. Cross-tabulation of author gender composition and article type in retracted publications

Pattern across author gender composition and publisher type

To address research question 3, we examined whether the gender composition of the author teams was associated with the publisher type for retracted articles. A Pearson chi-square test revealed a significant association, $\chi^2(40) = 67.077$, $p = 0.005$, indicating that the patterns of retraction across publishers varied according to authorship composition.

The largest cluster of retractions came from IOP Publishing ($n = 54$), predominantly authored by mixed-gender teams led by men ($n = 21$), followed by mixed-gender teams led by women ($n = 14$) and men-only teams ($n = 11$) in that order. Although women-only and sole woman authorship appeared in IOP titles, they were rare, suggesting some gender diversity but limited representation in these retracted outputs.

Elsevier ($n = 24$) and Springer ($n = 16$) displayed different profiles: Elsevier's retractions were almost exclusively male-dominated, whereas Springer's showed a more balanced distribution across gender categories. Notably, women-only authorship was absent from Elsevier, Emerald, Frontiers, and Hindawi, pointing to a restricted presence, or reduced visibility, of female-led work in these journals.

The Other publishers group, comprising outlets with fewer than five retractions each ($n = 61$), demonstrated the widest diversity in gender composition, although male-led mixed teams and male-only teams remained the most common. Despite the significant chi-square result, the Linear-by-Linear Association was not significant ($p = 0.937$), suggesting that the relationship is not linear but is shaped by categorical differences between publishers.

These findings imply that publisher-specific dynamics, such as disciplinary focus, editorial policies, and perceived accessibility, may shape the gender profile of authors whose work is later retracted. Differences in retraction frequency could also reflect variations in editorial oversight and ethical enforcement, raising broader questions about how gendered authorship interacts with distinct journal ecosystems, particularly under conditions of high publication pressure and uneven ethical infrastructure.

Publisher	Author						Total
	Man alone	Woman alone	Men only	Women only	Men-Women M first	Men-Women W first	
Others	9	4	14	2	19	13	61
IOP Publishing	1	1	11	6	21	14	54
Elsevier	1	0	7	0	10	6	24
Springer	1	0	4	0	9	2	16
Hindawi	0	0	0	0	7	4	11
MDPI	0	0	1	0	6	2	9
Frontiers	0	0	1	0	5	2	8
IEEE	0	0	3	3	1	1	8
Emerald	2	0	3	0	0	0	5
TOTAL	14	5	44	11	78	44	196

Table 5. Cross-tabulation of author gender composition and publisher type in retracted publications

Pattern across author gender composition and primary retraction reason

To address research question 4, we examined whether the principal reason for retraction (i.e., the first-cited rationale in each case) was associated with the gender composition of the author teams. This approach isolates the primary justification provided by journals or publishers and avoids inflation from multiple coded reasons for each article. A Pearson chi-square test revealed a significant association ($\chi^2(40) = 58.724, p = 0.028$).

Across the 196 retracted publications, the most common first-cited reasons were *Error in the article* ($n = 41$), *Notice – limited or no information* ($n = 40$), *Authorship and affiliation problems* ($n = 39$), and *Duplication and plagiarism* ($n = 28$). Clear gender-related patterns were observed. Male-dominated teams (Men only and mixed-gender teams led by men) accounted for the majority of retractions due to authorship and affiliation issues (27 of 39, 69.2%) and article errors (24 of 41, 58.5%). In contrast, women-only or sole woman authorship teams were more frequently retracted for unclear notices ($n = 6$) or technical faults ($n = 4$) rather than for violations of integrity or authorship.

Mixed-gender (male-led) teams appeared across all nine retraction categories, with substantial representation in authorship disputes ($n = 18$) and peer-review problems ($n = 4$). Men-only teams dominated the *Notice* category ($n = 12$), possibly reflecting negotiated or ambiguous retraction processes. Female-led teams were largely absent from retractions involving duplication, integrity breaches, or investigative actions, which may reflect lower publication volumes, concentrations in specific disciplines, or differential editorial scrutiny.

These results suggest that the grounds for retraction and the way they are framed may be shaped by systemic gender dynamics. Male-led teams are more often linked to professional misconduct or clear procedural breaches, whereas female-led teams are more frequently associated with opaque or procedural reasons. This asymmetry raises important questions: Are retraction standards and transparency consistently applied across gendered authorship structures? Are certain teams more exposed to overt misconduct labelling, while others are shielded by less explicit notices? Addressing these issues will require complementary qualitative research to

determine whether these patterns reflect genuine differences in misconduct incidence, disparities in publication practices or editorial bias in the construction of retraction narratives.

Retraction reason	Author						Total
	Man alone	Woman alone	Men only	Women only	Men-Women M first	Men-Women W first	
Error in the article	2	0	5	4	19	11	41
Notice - limited or no information	5	1	12	6	8	8	40
Authorship and affiliation problems	2	1	9	0	18	9	39
Duplication and plagiarism	5	2	10	1	6	4	28
Data issues	0	0	2	0	10	7	19
Problems with results, referencing, and attribution	0	0	3	0	9	1	13
Peer review and editorial process problems	0	0	2	0	4	1	7
Investigation and computer-generated content	0	1	1	0	1	2	5
Integrity and ethical compliance problems	0	0	0	0	3	1	4
TOTAL	14	5	44	11	78	44	196

Table 6. Distribution of first-cited retraction reason by author gender composition

Discussion

This study finds that the gender composition of author teams is significantly patterned across retraction patterns across article types, topical fields, publishers, and stated retraction reasons. Male-led or male-dominated teams were more frequently linked to retractions for severe breaches of research ethics (authorship disputes, plagiarism, and data fabrication) categories widely recognized as high-severity misconduct. Such outcomes point to gaps in shared accountability, research governance and editorial oversight. These results align with Agusta et al. (2023), who identified plagiarism and data fabrication as prevalent academic violations in Indonesia and recommended integrating real-world ethics cases into curricula, establishing independent ethics committees, and adopting contextually relevant institutional policies to address these issues.

In contrast, female-led teams were more often retracted for procedural or administrative reasons, such as duplicate submissions, communication breakdowns with editors, or inadvertent breaches of publication standards. Although not indicative of deliberate misconduct, these issues culminated in formal retractions. This divergence in retraction grounds supports the view that gender shapes both the visibility of errors and the framing of accountability in academia. Similar to the findings of Susilowati et al. (2023), our results suggest that female researchers may exercise greater caution in avoiding plagiarism but remain vulnerable to non-misconduct-related procedural challenges.

These observations reinforce the broader evidence of the gendered dimensions of research integrity. Zheng et al. (2025) reported that male first authors dominate retractions in STEM fields, where high-impact publishing pressure is acute. Fanelli et al. (2015) further noted that while men are more often associated with misconduct, women may bear greater reputational damage due to lower institutional status. Our findings extend these patterns to the Global South, showing that in Indonesia, male predominance in senior authorship roles correlates with ethically motivated retractions, whereas female-led teams face administrative vulnerabilities, possibly reflecting reduced institutional authority and support.

Authorship hierarchies amplify these dynamics. In Indonesia, as elsewhere, first and corresponding authors (roles often held by men) carry both prestige and ethical responsibility, making them more visible when violations happen. Female authors in less prominent positions may have limited decision-making influence but still share the consequences of procedural lapses.

Disciplinary patterns further clarify this picture. Retractions were more common in health and life sciences fields with intensive ethical oversight, where male-dominated teams were especially prominent in misconduct-related cases, echoing the previous findings of Sebo et al. (2023) and Maddi et al. (2025). In contrast, female-led teams were relatively more common in social sciences and education, where procedural issues may arise from less standardized editorial practices or weaker institutional publishing support.

These results must be interpreted with caution. Without normalizing retraction counts against the total number of publications by gender composition, this study cannot determine whether certain author groups are more susceptible to retraction. This shows that retractions operate within sociotechnical systems, where gender, discipline, authorship hierarchy, and institutional norms intersect to shape both the likelihood and framing of retraction events.

By presenting gender-disaggregated data from a Global South context undergoing rapid bibliometric change, this study broadens the literature on research integrity beyond a predominantly North American and European focus. This underscores the need to view retractions not solely as individual failings but as outcomes embedded in structural inequalities and systemic pressures within the global academic ecosystem.

These findings also have substantial implications for the governance of academic publishing, formulation of institutional policies, and integrity of research, particularly in contexts where publication output is intricately linked to career advancement and funding. First, institutions can mitigate ambiguity in ethical oversight by enhancing transparency concerning responsibilities for multi-author works. This can be accomplished by mandating standardized contributorship statements (e.g., CRediT), comprehensive authorship declarations, and explicit procedures for documenting data stewardship and decision-making throughout the research lifecycle. Second, capacity building should be regarded as an intervention for improving integrity. Universities and research organizations should provide structured training and mentorship in research ethics, journal selection, manuscript submission, and editorial communication, alongside administrative support to assist researchers in navigating ethical reviews, documentation, and compliance. Finally, policymakers and institutions should audit incentive programs that prioritize quantity over quality and introduce safeguards that reward robust methods, transparency, and responsible action. Risk-aware tools, such as the Research Integrity Risk Index (RI²) (Meho, 2025), can function as early warning signals to prompt internal quality control, mentoring, and process improvement rather than being employed as punitive labels.

Conclusion

This study finds a significant pattern across the gender composition of author teams and key characteristics of retracted publications by Indonesian scholars: reason for retraction, type of

publisher, article category, and discipline. Male-led teams were more frequently linked to serious ethical violations, such as authorship disputes, plagiarism, and data fabrication, whereas female-led teams were disproportionately associated with procedural or administrative issues, unclear retraction notices, and editorial miscommunications. These results challenge the assumption that retractions are purely objective corrections to the scientific record and suggest that gendered authorship structures shape both exposure to and framing of misconduct.

By situating these patterns within Indonesia's Scopus-driven incentive system, this study highlights how performance-based publication policies interact with institutional hierarchies and authorship conventions to produce uneven reputational risks. These findings support the need for research integrity frameworks that are both inclusive and context-sensitive, as suggested by the Leiden Manifesto for Research Metrics (Hicks, 2015). At the policy level, funding bodies and higher education regulators can integrate ethical risk measures, such as the Research Integrity Risk Index (RI²), into institutional evaluations.

While this study contributes novel insights, it is not without limitations. Gender classification was deduced from the authors' names, which may have introduced misclassification bias. The analysis was confined to the primary reason for retraction and to publications indexed in Scopus. The exclusion of variables such as team size, funding, and international collaborations constrains the scope of this study. Moreover, the conclusions drawn in this study should be interpreted in light of the available data and the use of absolute retraction numbers, and they are intended to reflect observed patterns rather than provide definitive comparative assessments across author groups. Future research should employ a mixed-methods approach that integrates quantitative analysis with qualitative interviews involving retracted authors, journal editors, and institutional ethics committees. Such research could elucidate the mechanisms underlying the observed gendered patterns and identify context-specific interventions for addressing them. Comparative studies across multiple Global South countries with analogous performance-based publication systems would further determine the generalizability of these findings beyond Indonesia's borders.

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