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Original Article

27

Retracted Articles in the Field of Public, Environmental and Occupational Health: A Descriptive Study

Halk Sağlığı, Çevre Sağlığı ve İş Sağlığı Alanlarında Retrakte Edilen Makaleler: Tanımlayıcı Bir Çalışma

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ABSTRACT

Objective: Retraction is a process brought up when concerns about the integrity of a paper arise. It is widely accepted that a notable increase occurred in the last years. This study aims to explore retractions in public, environmental and occupational health research.

Material and Methods: The type of this study is descriptive. The authors searched the Web of Science database for retractions in public, environmental and occupational health research. Publication date, retraction date, the number of days between the publication and retraction dates, journal names, document type, the country of the corresponding author, reasons for retraction, the source of the retraction request, journal index, and citation count of the retracted papers were recorded.

Results: A total of 192 papers were evaluated. The median time between the papers' publication date and the retraction date was 498 days. The median citation count was 1. A notable increase in the number of retracted papers over recent years was observed, with a peak in 2015. The most commonly identified reasons for retraction were: error (n=59), plagiarism (n=43), and duplication (n=25).

Conclusion: The increasing number of retractions indicates both challenges and improvements in scientific publishing. Editorial and peer-review practices should be improved, awareness among the authors needs to be raised, and more effective post-publication monitoring systems should be implemented.

Keywords: Retraction, public health, occupational health, environmental health

ÖZ

Amaç: Retrakte etme, bir makalenin güvenilirliği ilgili endişeler ortaya çıktığında gündeme gelen bir süreçtir. Son yıllarda retrakte edilen yayın sayısında önemli bir artış olduğu yaygın olarak kabul edilmektedir. Bu çalışmanın amacı halk sağlığı, çevre ve iş sağlığı alanında retrakte edilmiş yayınları incelemektir.

Gereç ve Yöntemler: Bu çalışma tanımlayıcı bir çalışmadır. Halk sağlığı, çevre ve iş sağlığı alanında retrakte edilen yayınlar için Web of Science veritabanı taranmıştır. Basım tarihi, retrakte edilme tarihi, basım ve retrakte edilme tarihleri arasındaki kalan gün sayısı, dergi adları, makale tipi, sorumlu yazarın ülkesi, retrakte edilme nedenleri, geri çekme talebinin kimden geldiği, derginin dizini ve retrakte edilen makalelerin atıf sayısı kaydedildi.

Bulgular: Toplamda 192 makale değerlendirildi. Makaleler için yayın tarihi ile retrakte edilme tarihi arasındaki medyan süre 498 gündü. Medyan atıf sayısı 1'di. Son yıllarda retrakte edilen makale sayısında önemli bir artış olduğu gözlemlendi. Retrakte edilen makale sayısının en fazla olduğu yıl ise 2015 olarak bulundu. En sık retrakte edilme sebepleri; hata (n=59), intihal (n=43) ve duplikasyondu (n=25).

Sonuç: Retrakte edilme sayısının artması bilimsel yazında hem birtakım zorluklara hem de süreçteki gelişmelere işaret etmektedir. Editöryal ve hakem değerlendirme süreçleri iyileştirilmeli, yazarların konu hakkında farkındalığı artırılmalı ve etkin basım sonrası bildirim sistemleri süreçlere dahil edilmelidir.

Anahtar Kelimeler: Retrakte edilme, halk sağlığı, iş sağlığı, çevre sağlığı

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INTRODUCTION

The publication process of a scientific paper relies heavily on the trust and cooperation of several stakeholders: the authors, the readers, the publishers the peer reviewers, and editors who play active roles in ensuring the reliability and integrity of the research. At any stage of this process, if the mutual trust between these parties is compromised, retraction may be considered (1). Retraction is a formal process initiated when concerns arise about the reliability of a scientific study. These concerns can stem from a variety of issues, including errors, data duplication, plagiarism, and ethical violations (2). In this context, retraction serves as an important correction mechanism within the scientific literature, addressing and rectifying any discrepancies or misconduct that may have undermined the credibility of the published work (3).

However, recent years have witnessed a notable increase in the number of retractions across various fields of science (4). This trend is closely tied to the pressures of the "publish or perish" culture, which has become a driving force in academia. With an ever-growing emphasis on publishing frequently and quickly to secure academic advancement and funding, many researchers find themselves under immense pressure to produce results (1-3). This pressure can lead to shortcuts in research practices, including data manipulation, misreporting, and even ethical lapses, all of which can ultimately result in retraction.

The consequences of retractions in scientific publishing can be far-reaching, particularly in fields like medicine, where research directly informs clinical practices and patient care. When a study is retracted, it signals that the findings are unreliable or flawed, which can undermine public trust in the medical literature (5). For clinicians and healthcare providers who rely on published research to guide treatment decisions, a retracted study can create confusion, delays in adopting best practices, or, in some cases, even harm patients (6). In the medical field, where the stakes are literally life and death, ensuring the accuracy and trustworthiness of published research is of utmost importance, not only for the advancement of science but also for patient well-being.

This study aims to explore retractions in public, environmental, and occupational health research. By analyzing retracted studies, we seek to identify common reasons behind these retractions and raise awareness of the importance of scientific integrity in research, underlining its implications for evidence-based decision-making.

MATERIALS and METHODS

This is a descriptive study. Due to the challenges of integrating databases and accessing specific information, we decided to work with a single database and chose Web of Science (WoS) because it is the oldest database, with wide coverage and high data reliability. The authors used the WoS database on July 20, 2023, and filtered by category "public, environmental and occupational health," document type "retraction, retracted publication, withdrawn publication" to identify a series of retracted publications. No exclusions were made based on the publication date, and all articles from all time periods available in the database were included in the study. In total, 246 retracted articles along with their retraction notes were saved in a file for further evaluation. Articles that were repeated, had unverified retractions, or were book chapters were excluded from the study. There were no humans or animals involved in the study. Since open data analysis was used, ethics committee approval was not required.

The classification of retraction reasons was applied according to the following explanations, taking into account the current literature (3,7):

i) Error (improper study design, insufficient data collection, presentation, or report)

ii) Fraud (data, figure, case, or image manipulation, fabrication, and falsification)

iii) Author disagreements and conflicts (publication without an author's knowledge or approval, identification of fictitious authors, or conflict between authors and funders)

iv) Duplication (double publication of the same article)

v) Ethical issues (absence of ethics committee permission, failure to obtain consent from participants)

vi) Peer-review issues (fake or biased peer-review methods, as well as other issues concerning this process)

vii) Plagiarism (misuse of individuals' scientific properties, such as papers, texts, study designs, tables, graphs, figures, and ideas. This category also includes self-plagiarism)

viii) Unknown (not specified)

Statistical Analysis

The data evaluated included the publication date, retraction date, the number of days between the publication and retraction dates, journal names, document type, the country of the corresponding author, reasons for retraction, the source of the retraction request, journal index, and citation count.

Two researchers (EK and RG) independently assessed the reasons for retraction and compared their evaluations. In case of discrepancies, the two researchers collaborated to make a final decision. For continuous variables, mean, standard deviation, median, minimum, and maximum values were calculated, while frequencies and percentages were used for categorical variables.

To examine changes in the number of retracted publications over the years, linear regression analysis was applied. Minitab software was used to visualize linear changes and to forecast the number of retracted publications in future years.

RESULTS

After applying the WoS-based search strategy, 246 retracted papers were recorded in the public, environmental and occupational health category. After applying the exclusion criteria, a total of 192 papers remained for the final analysis, excluding 52 repeated papers, 1 non-retracted paper, and 1 book chapter. The flow chart of the study algorithm is shown in Figure 1.

The median time between the publication date and the retraction date for the papers was 498 days (min=0, max=5497). The median citation count was 1 (min=0, max=158) (Table 1).

Regarding the retracted papers, the highest number was observed in 2015. Regression and trend analysis indicated an increase in the number of retracted papers in recent years ($Yt=-2.51 + 1.261 \times t$). The expected numbers of retracted papers in the public, environmental and occupational health category for the years 2023, 2024, and 2025 were estimated to be 22.7, 23.9, and 25.2, respectively (Figure 2).

Table 2 lists the top 10 journals with the most retractions. Toxicology and industrial health (n=12), European journal of contraception and reproductive health care (n=9), and frontiers in public health (n=8) were the top journals in this field.

Table 3 lists the top 10 countries with the most retracted papers. The United States of America had the most retracted papers, with 38 publications, accounting for 19.8% of all retracted publications worldwide. Iran followed with 20 (10.4%) retracted papers, and China was third with 17 (8.9%) retracted papers.

The retracted papers were categorized based on the reasons for retraction, which were evaluated by researchers who reviewed the retraction notes. The most commonly identified reasons for retraction were error (n=59), plagiarism (n=43), duplication (n=25), unknown (n=16), peer review issues (n=14), ethical issues (n=14), fraud (n=13), and author disagreements or conflicts (n=8) (Figure 3).

Seventy percent of the retracted papers were original articles, 18% were reviews, and 12% were other types of documents. When examining the decision-making points for retraction requests, it was found that 71% of the decisions were made by publishers, 24% by authors, 2% by both publishers and authors, and 3% by unknown parties. The types of retracted documents, retraction requests and decisions, the journal index of the articles are shown in Figure 4.

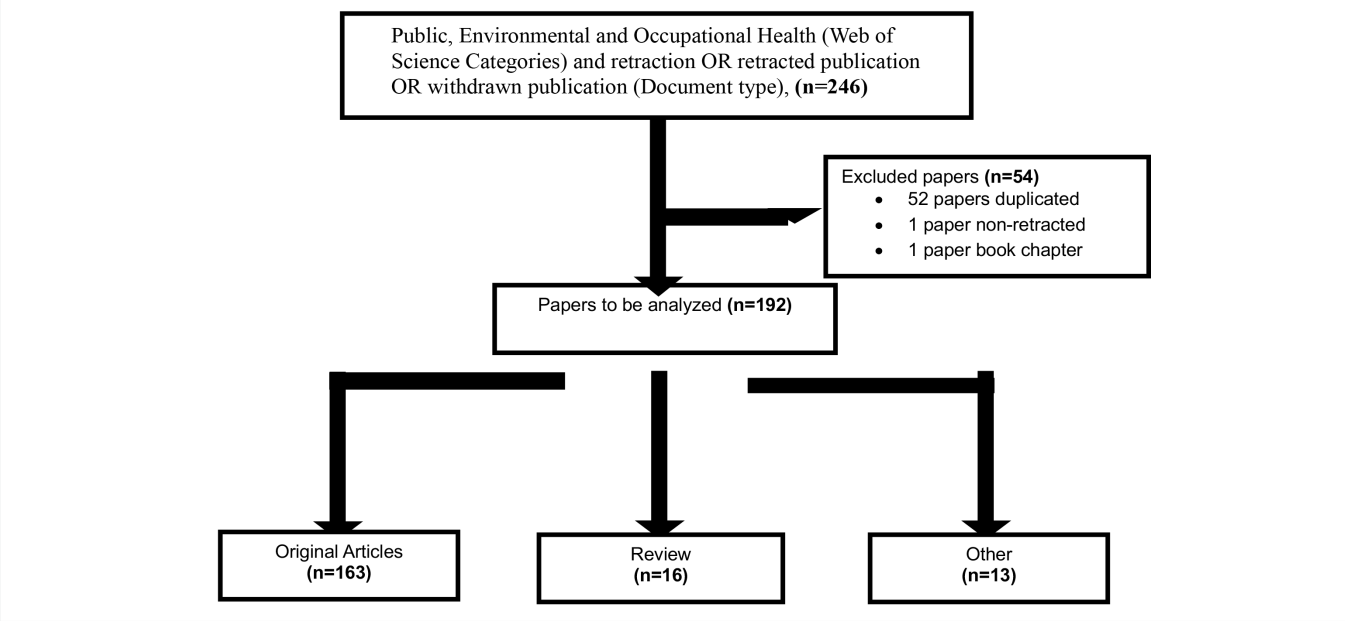

Figure 1. The algorithm of study

Table 1. Publication duration and citation count of retracted papers

	Mean	SD	Median	Minimum	Maximum
Duration of publication (days)	806.1	881.8	498	0	5437
Citation count	7.1	18.1	1	0	158

SD: Standard deviation

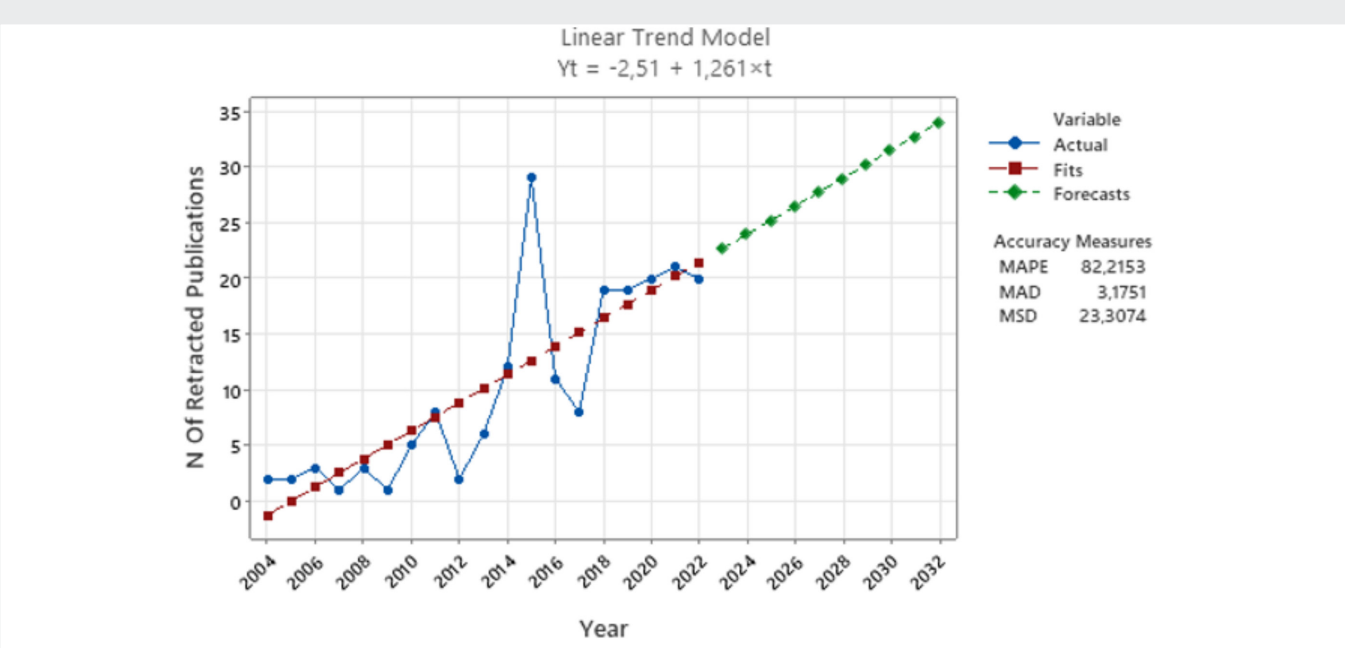

Figure 2. Trend analysis for retracted paper
MAPE: Mean absolute percentage error, MAD: Mean absolute deviation, MSD: Mean square deviation

Table 2. Top 10 journals with the most retractions

	N	%
Toxicology and Industrial Health	12	6.3
European Journal of Contraception and Reproductive Health Care	9	4.7
Frontıers in Public Health	8	4.2
Pan African Medical Journal	7	3.6
International Journal of Environmental Research and Public Health	6	3.1
BMC Public Health	5	2.6
Journal of Community Psychology	5	2.6
Environmental Geochemistry and Health	5	2.6
Environmental Health Perspectives	5	2.6
Cancer Epidemiology Biomarkers & Prevention	4	2.1
N: Number		

Table 3. Top 10 countries with the most retracted papers

	N	%
Usa	38	19.8
Iran	20	10.4
China	17	8.9
India	15	7.8
Egypt	14	7.3
UK	14	7.3
Australia	6	3.1
Kenya	5	2.6
Cameroun	4	2.1
Russia	4	2.1
N: Number		

DISCUSSION

Our findings indicate a notable increase in the number of retracted papers over recent years, with a peak observed in 2015. Many publications examining retracted articles mentioned an increase over the recent years (3,4,8-13). It is not surprising that we have also found, in our study examining retracted articles in the field of public health, an increase over the years. One reason for this may be that published research can be easily reached by everyone, which increases the auditability of the literature, thanks to developing technology and the internet. Another reason may be the increase in the volume of published research, which naturally can lead to more retractions in a larger pool of papers. Another issue that should be emphasized is that articles that are retracted in the field of medicine may also affect the treatments given to patients, and this requires special sensitivity during evaluation. The retraction of some articles related to treatment during the COVID-19 pandemic that we have recently experienced has threatened the trust that society has in science (14-18).

The median time between publication and retraction was found to be 498 days, which highlights that, on average, retracted papers remain in the literature for over a year before being flagged. The lag between the publication dates and retraction of articles was found to be of varying duration

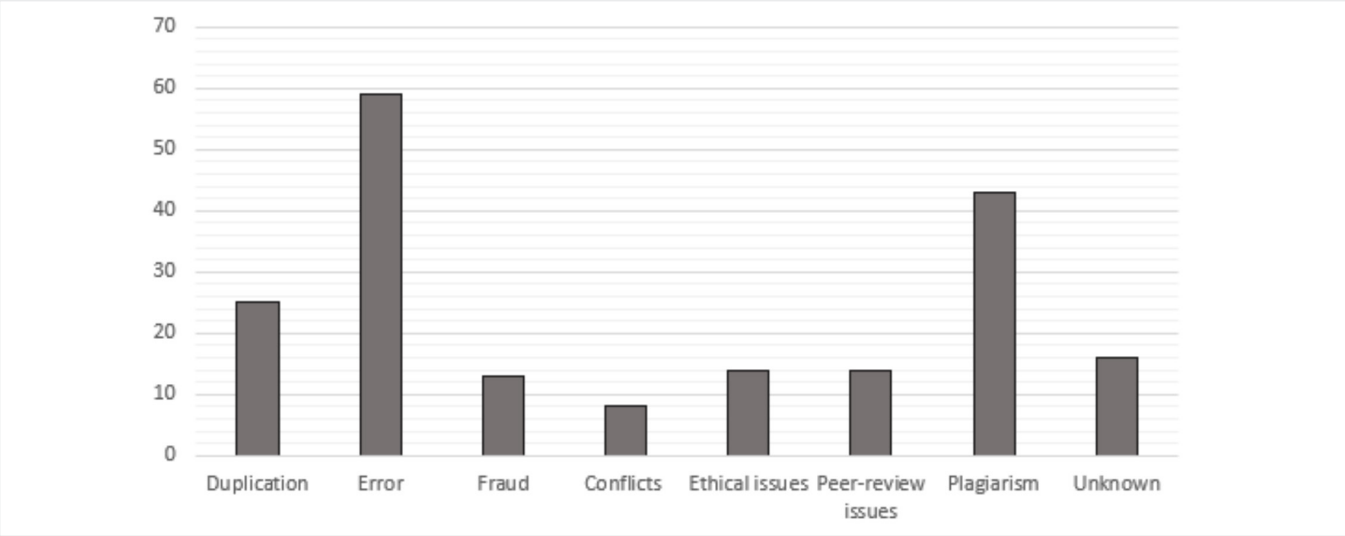

Figure 3. The most common reasons for retraction

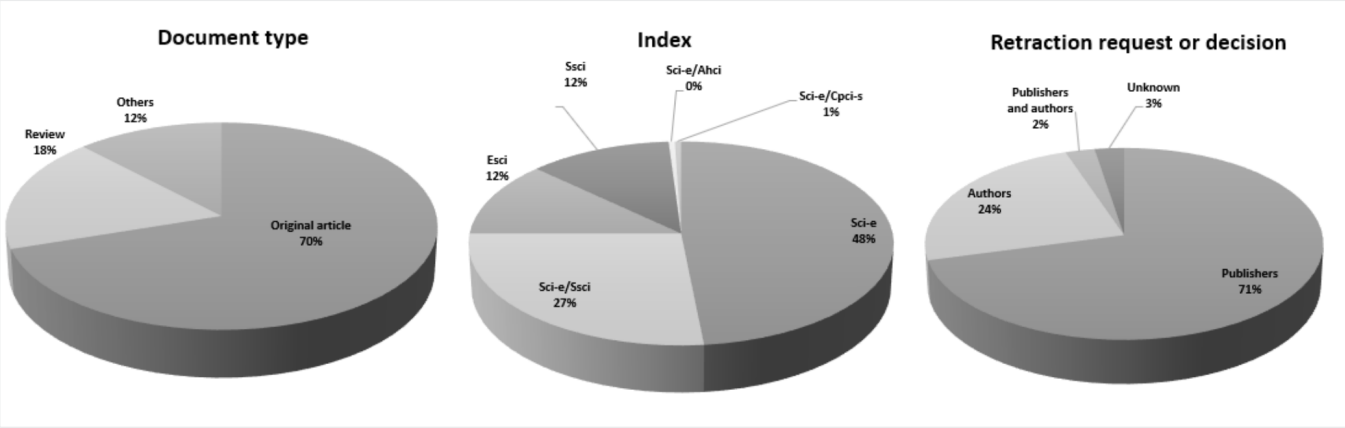

Figure 4. Document types, indexes and sources of retraction decisions of papers

when looking at studies examining this topic (3,8,19,20). This may be due to the different methodologies used in examining various research fields (e.g., life sciences) and the types of articles (e.g., original articles). Nevertheless, the delay in retraction is a concerning issue, since it means that flawed research may be disseminated and cited by other researchers before it is officially retracted. luckily, for public, environmental and occupational health papers, we found the median citation count for retracted papers is just 1, which may suggest that most retracted papers had a minimal impact on the scientific community in terms of citations, though a small proportion had a significant influence before being retracted. It is expected that a retracted article will be cited only in the context of the retraction. However, in practice, this is not the case and sometimes these articles may be cited by inexperienced authors (3). To prevent this, retraction notes must be published swiftly and accessible to all authors openly. The use of databases such as the Retraction Watch Database allows for earlier detection of retracted articles and thus prevents these articles from being mistakenly cited in another article (21).

The most common reasons for retraction were error, plagiarism, and duplication. These findings are similar to previous literature, where duplication and plagiarism have been frequently identified as the primary causes for retraction (22-24). However, we found scientific errors to be more frequent in the field of public, environmental and occupational health. Errors in data analysis, miscalculations, or misinterpretations of data are sometimes identified post-publication, leading to retraction. Plagiarism and duplication are particularly concerning, as they point to ethical breaches that undermine the credibility of the research process. Most of the retracted papers were original research articles. This distribution reflects the higher volume of original

research published in scientific journals. Original articles are also thought to be more prone to errors or misconduct; therefore, higher retraction rates are not quite surprising (3,7). Interestingly, retraction decisions were primarily made by publishers, rather than authors, suggesting that publishers play a crucial role in overseeing the integrity of the literature after publication.

Study Limitation

This study highlights the ongoing challenges faced by the scientific community in maintaining the integrity of published research. The main strength of this study is the examination and evaluation of a relatively large number of publications regarding their retraction. Several limitations, however, can be identified in the current paper. We only searched one database, so our results cannot be extrapolated to all publications in the field of public, environmental and occupational health. Secondly, we only selected a specific field, which also obstructs generalizability. Finally, as with the COVID-19 pandemic, trends in retraction may change over time. This article examined only a specific time period.

CONCLUSION

The increasing number of retractions indicates both challenges and improvements in scientific publishing. While the majority of retracted papers appear to have had minimal impact in the field of public, environmental and occupational health, considering the low value of the median citation number, the influence of widely cited retracted papers can be profound. Another feature that should be underlined about the publications in the field of public, environmental, and occupational health was that the retraction was primarily due to scientific errors rather than on more serious ethical grounds. Continuous efforts are needed to refine editorial and peer-review practices, increase transparency, raise awareness among the authors, and implement more effective post-publication monitoring systems.

Ethics

Ethics Committee Approval: There were no humans or animals involved in the study. Since open data analysis was used, ethics committee approval was not required.

Informed Consent: Since no humans or animals were involved in the study, patient consent information is not required.

Footnotes

Author Contributions

Concept: R.A.O., E.K., Design: R.A.O., R.G., E.K., Data Collection or Processing: R.G., Analysis or Interpretation: R.A.O., E.K., Literature Search: R.A.O., Writing: R.A.O., R.G., E.K.

Conflict of Interest: All authors declare that they have no conflict of interest.

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