Promoting Preprint Awareness and Adoption in Africa: A Need-Driven Perspective From the African Region

Oluchukwu Ifeyinwa Ezechukwu[1], Tolulope Joseph Ogunniyi[2], Roseline Dzekem Dine[3]

1. Department of Public Health, St. Luke Business School, Enugu State, Nigeria.
2. Department of Medical Microbiology and Parasitology, University of Ilorin Teaching Hospital, Ilorin, Kwara State, Nigeria.
3. Department of Social Science and Community Engagement, Rinda Ubuzima, Kigali-Rwanda.

Abstract

Introduction

Over the years, preprint has grown, especially since its impact contribution during the health emergency of the COVID-19 pandemic, and is gradually drawing the interest of funders. However, the embrace of preprint varies across different regions, with the rate of acceptability and use of preprint by researchers also leading to hesitance and resistance to submit research articles to the preprint server; hence, this is attributed to the concerns surrounding the integrity and validity of preprint articles. This study assesses the awareness, adoption, and promotion of preprints in Africa.

Method

This study employed a descriptive cross-sectional study design carried out among African researchers. The data were collected using an online-based, semi-structured questionnaire assessing the awareness of preprint, institutional uptake, and promotion in Africa. However, the study also assesses their opinion on the promotion of preprint and its credibility in the African research community. The qualitative data was analyzed for themes using Microsoft Excel Package, and the quantitative data were analyzed for descriptive and chi-square using SPSS version 26.0.

Results

Among participants, 64% were aware of preprints, 40% reported institutional promotion, and 62% recognized their relevance to institutional roles. However, 53% cited limited recognition of preprints within the scientific community. Desired benefits from preprint clubs included research

funding support (83%), open peer review (82%), and access to shared opportunities (79%). No significant associations were found between participants' country, research domain, education level, or institutional role and preprint awareness, or promotion or perceived role of preprint in Africa. Participants recommended educational workshops, partnerships with academic institutions, targeted online campaigns, and localized resources to enhance preprint adoption and foster an open science ecosystem across Africa.

Conclusion

Preprint adoption in Africa requires addressing awareness gaps, institutional recognition, and community acceptance. Collaboration efforts, including educational initiatives, partnerships, and localized outreach, are crucial to fostering an ecosystem that supports preprints and advances open science practices.

Keywords: Preprint, Assessment, Africa, Research, Scientific Papers, Publications

Introduction

Worthy of adopting fully into the research community is a preprint. Preprints are open-access scientific papers shared publicly through a preprint server before they are submitted to a journal. It is mostly made available as a research result through publication before an official publication is made. Preprint articles are published on a preprint server—a media archive where articles are made free of charge, fostering rapid engagement, giving equal access to information to everyone globally, and giving feedback to authors from a wider audience (1-3).

Preprint articles have facilitated quick access, upload, and reading of articles with citations in journal articles. These articles can be used as a discussion forum for article results; discussing the results of preprint articles helps increase the quality of the research for a peer review submission (1-3). Preprints are made available publicly through a preprint server before or at the time of submission to a journal, at times as part of the journal submission process. Although it does not serve as a formal publication, it can still be cited since articles published on preprint servers by researchers are identified with a unique DOI automatically generated, as with articles published in peer-reviewed journals. An important issue with preprint remains the validity of the quality of the

data and the possibility that the article was appropriately revised by experts (1, 6). The rate of acceptability and use of preprint by researchers also leads to hesitance and resistance to submit research articles to the preprint server; hence, this is attributed to the concerns surrounding the integrity and validity of preprint articles. Many still doubt preprint articles and these doubts cannot be overlooked, as even editors have reservations about the scientific integrity, credibility, validity, and quality checks and screening of preprints. Therefore, there is a need to promote and ascertain the quality of the preprint (4-5).

Over the years, preprint has grown, especially since its impact contribution during the health emergency of the COVID-19 pandemic, and is gradually drawing the interest of funders (2). Preprints, acknowledged as scientific articles, have been for a long time, with ARxiv being the first preprint server to exist, emerging as a formal research dissemination in the early 1990s, but now records over 1.3 million preprints in physical sciences. The Social Science Research Network (SSRN) emerged as a preprint server with an initial focus on social science research (1), but since 2013, several preprint servers have been launched, covering a wide range of topics and fields; this indicates the growing recognition of preprint across all fields. The types of preprint servers available and recognized by peer-reviewed journals, including Arvix, academia, researchgate, Open Science Framework (OSF), 4shared, INArvix, bioRxiv, Accelerating Science and Publication in Biology (ASAPbio), et cetera (1,2,4,).

In many countries, preprint servers among academics are still very low, and this is attributed to the poor knowledge of preprint and its function. Lack of understanding of preprint is on the increase even with its many advantages (3). However, a study showed that preprints are 42% and 58% recognized and understood by researchers. This was attributed to the reason why about 35% of academics assume that an article published as a preprint can no longer be submitted for publication as a journal paper, and many researchers choose to publish an article in a journal rather than as a preprint, not minding the time and cost differences (1,2).

Preprints enable the publication of articles on time at a low cost with easy access owing to DOI allocation and are beneficial as they make articles available faster, avoiding the long processes and the time it takes for journal publications. It also allows for a wider review from the research community that otherwise would have only been done by minimum peer reviewers. However, the

rising concern that some articles are not often appropriately designed due to a lack of a formal peer review is the reason why some journals do not accept preprint posting, and researchers are often reluctant to submit their articles as preprints that are not indexed by servers like PubMed, Scopus or Web of Science, resulting in a decrease in preprint usage.

A preprint exists to make scientific knowledge freely available to the public before it is traditionally validated through peer review as authors feel the need to share with the public, especially concerning public health reasons. Authors may also desire to have their work discussed before formal peer review and journal publication, or even after that, the manuscript has been submitted to a journal or is already being reviewed and is awaiting formal publication. In some cases, many other reasons prompt authors into publishing a preprint, and these reasons include that an article may have been submitted to journals and was rejected, the need for authors to make negative data available, the need for fast dissemination of the knowledge of their results, and the need to establish priority of scientific findings (1,3,4).

Preprint is reported as an interim step to journal publication, increasing dissemination of articles, transparency, high visibility, and productivity, the independent and open review process, and opportunities that need validation and an increase in usage. This can be achieved through generating policies and guidelines for all involved in preprint (funders, publishers, journals, editors, reviewers, and researchers) (2,3).

The Rwanda Preprint Club was birthed in early 2024 with the support of an ASAPbio community grant and, at the moment, has over 20 members, mostly from Rwanda. The club was established to encourage researchers and disseminate knowledge on preprints, including developing preprint articles as individuals or groups. Some of the club activities include developing preprints, preprint reviews, and publications. To promote open science access in Africa, a need assessment study was conducted. This is a designed approach to enable the club to understand the awareness, preprint promotion, and adoption in Africa.

Methods

Study Design

The study was a descriptive cross-sectional study design. It was carried out among African researchers from the fields of biomedical science, social science, life science, and health science. The study aimed to assess the awareness, knowledge, acceptance rate, and challenges of preprint in Africa as a means of research dissemination and to reveal the value of preprint among African researchers who gave consent to participate in this research. The survey employed convenient non-probabilistic sampling techniques to reach the intended participants across Africa. The research population includes academia, students, and researchers who have either pre-printed their work or have not preprinted or used preprinted papers. Researchers from other continents and those who did not consent to participate were excluded from this survey.

Data Collection

The need assessment study employed an online-based semi-structured questionnaire with close-ended and open-ended questions to assess the researchers' awareness, knowledge, and acceptance of Preprint and its challenges in Africa as a means of research dissemination. The questionnaires were disseminated across various research platforms using social media, and the estimation time was approximately 15 minutes. Collected data was made available to club administrators and was confidentially treated as guided by ASAPbio data protection policy [https://asapbio.org/privacy-policy]. Participation was voluntary. Each participant's data was effectively managed and kept confidential. Incentives were also provided to randomly selected participants as a means of appreciation.

Ethical Approval and Dissemination Plan

Ethical approval was not collected for this study being a low-risk survey. However, consent was sought from each participant for inclusion in this study. All information was kept confidential and used for research dissemination. The research will be published as a preprint and be presented at the end-of-the-year party of the Rwanda Preprint Club.

Data Analysis

Data was collected using Microsoft Excel and imported into SPSS version 26. Descriptive statistics such as frequency, percentage, and charts were used to present the descriptive data. A test of association was conducted between the socio-demographics of the participants and their awareness, promotion of preprint, and relevance of preprint to their role in the institution using chi-square with a Pvalue≤0.05 taken as significant. However, Microsoft Excel was used to analyze qualitative data, which were coded as a theme for better comprehension and interpretation.

Results

Quantitative Analysis

Participant Demographics

This study involved 100 participants, of whom 67% were male. Most participants held a Master's degree (55%) and identified medical research as their primary research domain (48%). Additionally, 35% of the participants were students (Table 1). Participants came from 17 countries in the African region. The majority were from Nigeria (27%), followed by Rwanda (16%) and Zambia (9%) (Figure 1).

Awareness and Promotion of Preprints

This study reported on the awareness and promotion of preprints in African institutions. Overall, 64% of participants were aware of preprints, while only 40% identified that their institutions promote their uptake. Furthermore, 62% recognized the relevance of preprints to their roles in their

institutions. However, 15% reported no relevance, and 23% were unsure about the relevance of preprints to their roles (Table 2).

Challenges to Preprint Adoption

The most commonly identified challenge among participants was the lack of recognition of preprints in the scientific community (53%). Other notable challenges included academic requirements and non-use of preprints (23%), while 8% identified other barriers (Figure 2).

Desired Club Benefits

Participants highlighted the benefits they hoped to gain from the club. The top five benefits were: research funding proposal support (83%), open peer review (82%), access to shared opportunities (79%), scholarly writing and reading resources (73%), and career development and growth (69%) (Figure 3).

Association Between Socio-Demographics and Preprint Awareness

The analysis revealed varying levels of preprint awareness among participants across socio-demographic groups:

By Country

Awareness was highest in Uganda (75%), Nigeria (70.4%), and Rwanda (68.8%), while it was absent in Benin and Malawi (0%). Moderate awareness levels were observed in Cameroon (57.1%) and Zambia (55.6%). However, the association between country and awareness was not statistically significant ($p = 0.622$).

By Research Domain

Medical researchers had the highest awareness (68.8%), followed by participants in business research (66.7%) and scientific research (64.7%). Social researchers had the lowest awareness

(33.3%). The association between the research domain and awareness was not significant (p = 0.630).

By Education Level

Postdoctoral participants and those in the "other" category reported 100% awareness, while master's degree holders had 61.8% awareness, and undergraduates reported 60% awareness. No significant association was observed (p = 0.372).

By Role in Institution

Researchers (78.3%) and university lecturers (69%) exhibited higher awareness compared to students (54.3%) and librarians (50%). This association was also not significant (p = 0.358) (Table 3).

Association Between Socio-Demographics and Preprint Promotion

Institutional promotion of preprints also varied across socio-demographics:

By Country:

Zimbabwe (100%) and Somalia (75%) reported the highest levels of institutional promotion. In contrast, countries like Zambia (11.1%) and Cameroon (14.3%) showed minimal promotion. Nigeria exhibited moderate promotion (37%). The association between country and promotion was not statistically significant (p = 0.198).

By Research Domain

Business research participants reported the highest promotion levels (66.7%), followed by scientific research (52.9%). Medical research showed the lowest promotion levels (31.3%). No significant association was observed (p = 0.209).

By Education Level

Postdoctoral participants (100%) reported the highest promotion, while undergraduates (60%) and master's degree holders (61.8%) also demonstrated notable levels. No significant association was observed.

By Role in Institution

Researchers (78.3%) and university lecturers (69%) experienced higher promotion rates compared to students (54.3%) and others (54.5%). This association was not significant (Table 4).

Association Between Socio-Demographics and Perceived Role of Preprints

Participants' perceptions of preprint relevance to their roles varied as follows:

By Country

Kenya, Somalia, and Ethiopia reported 100% awareness of preprint relevance, while Zambia (22.2%) and Cameroon (42.9%) showed lower levels. No significant association was observed ($p = 0.325$).

By Research Domain

Participants in educational research (83.3%) and scientific research (70.6%) were more likely to view preprints as relevant, while medical researchers showed moderate relevance levels (52.1%). The association was not significant ($p = 0.640$).

By Education Level

Postdoctoral participants (100%) and master's degree holders (65.5%) had the highest relevance perceptions, while undergraduates reported lower relevance (56%). No significant association was observed ($p = 0.861$).

By Role in Institution

Researchers (73.9%) and university lecturers (58.6%) found preprints more relevant compared to students (54.3%). This association was not statistically significant ($p = 0.586$) (Table 5).

Table 1: Socio-demographic of the participants (n=100)

Variables	Frequency	Percentage
Sex		
Male	67	67.0
Female	33	33.0
Highest Level of Education		
Undergraduate	25	25.0
Masters	55	55.0
Doctor of Philosophy (PhD)	13	13.0
Post Doctorate	2	2.0
Others	5	5.0
Research Domain		
Scientific Research	34	34.0
Social Research	6	6.0
Medical Research	48	48.0
Educational Research	6	6.0
Business Research	3.0	3.0
Others	3.0	3.0
Role Played in Institution		
Librarian	2	2.0
University Lecturer	29	29.0
Researcher	23	23.0
Students	35	35.0
Others	11	11.0

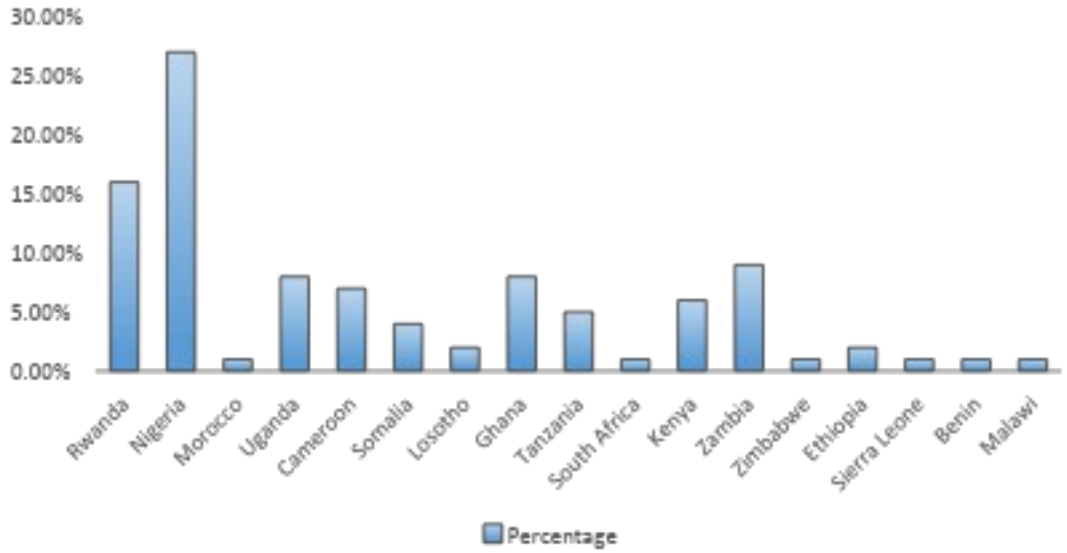

Figure 1: Distribution of participants across countries (n=100)

Table 2: Awareness and promotion of Preprint in Institution (n=100)

Variable	Frequency	Percentage
Awareness of Preprint		
Yes	64	64.00
No	36	36.00
Does Your Institution Promote Preprint		
Yes	40	40.00
No	60	60.00
Relevance of Preprint to Your Role In Institution		
Yes	62	62.00
No	15	15.00
I Don't Know	23	23.00

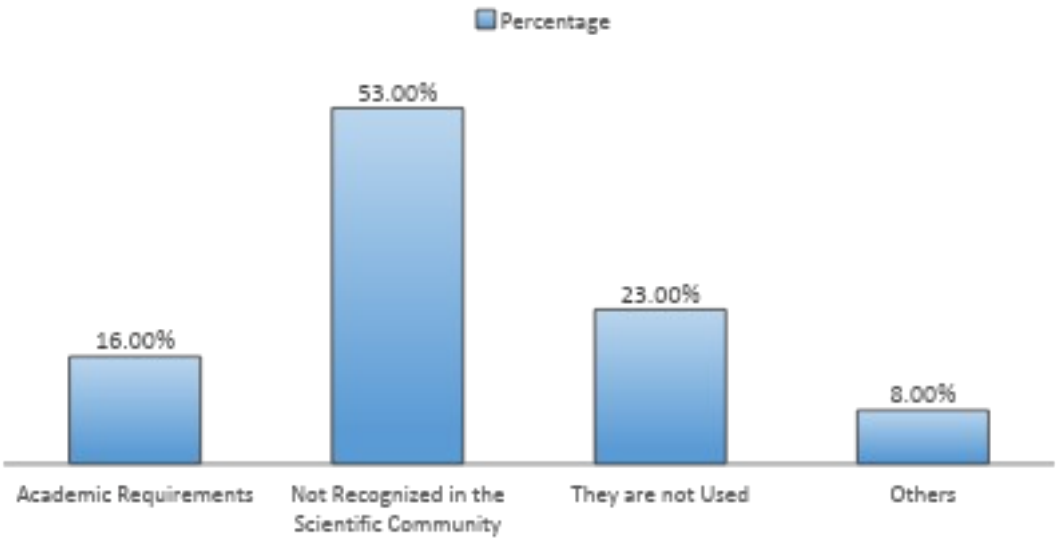

Figure 2: Distribution of challenges and barriers to preprint sharing in Rwanda and Africa among participants (n=100)

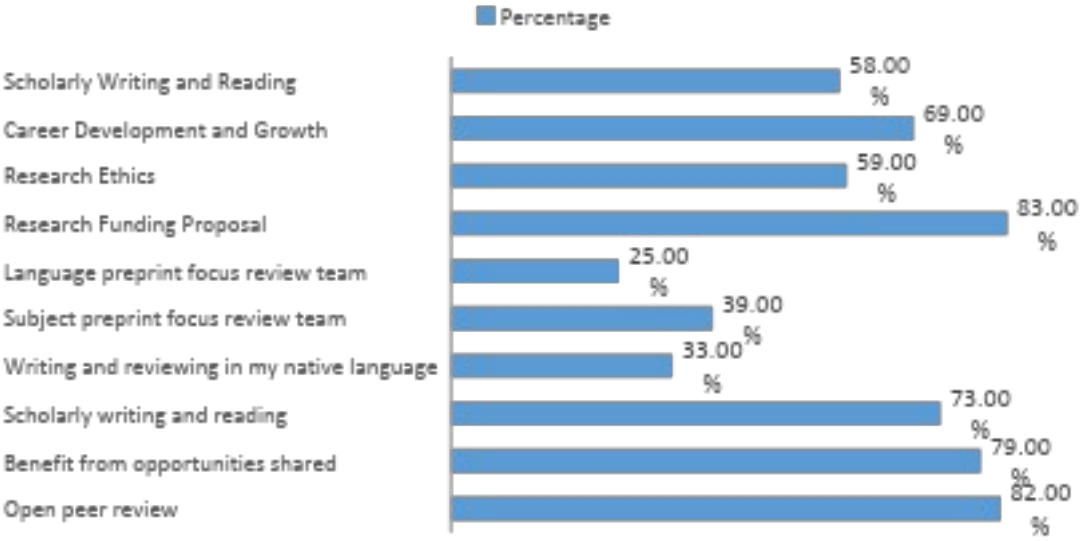

Figure 3: Distribution of benefit from a preprint club among participants (n=100)

Table 3: Association between awareness of preprint of socio-demographics of the participants (n=100)

Variables	No Examined	Yes N(%)	No N(%)	Pvalue
Country				
Rwanda	16	11(68.8)	5(31.3)	
South Africa	1	1(100.0)	0(0.0)	
Kenya	6	4(66.7)	2(33.3)	
Zambia	9	5(55.6)	4(44.4)	
Zimbabwe	1	1(100.0)	0(0.0)	
Ethiopia	2	1(50.0)	1(50.0)	

Sierra Leone	1	1(100.0)	0(0.0)	
Benin	1	0(0.0)	1(100.0)	0.622
Malawi	1	0(0.0)	1(100.0)	
Nigeria	27	19(70.4)	8(29.6)	
Morocco	1	0(0.0)	1(100.0)	
Uganda	8	6(75.0)	2(25.0)	
Cameroon	7	4(57.1)	3(42.9)	
Somalia	4	1(25.0)	3(75.0)	
Losotho	2	0(0.0)	2(100.0)	
Ghana	8	4(50.0)	4(50.0)	
Tanzania	5	4(80.0)	1(20.0)	
Research Domain				
Scientific Research	34	22(64.7)	12(35.3)	
Social Research	6	2(33.3)	4(66.7)	
Medical Research	48	33(68.8)	15(31.2)	
Educational Research	6	3(50.0)	3(50.0)	0.630
Business Research	3	2(66.7)	1(33.3)	
Others		2(66.7)	1(33.3)	
Highest Level of Education				
Undergraduate	25	15(60.0)	10(40.0)	
Masters	55	34(61.8)	21(38.2)	
Doctor of Philosophy (PhD)	13	8(61.5)	5(38.5)	0.372
Post Doctorate	2	2(100.0)	0(0.0)	
Others	5	5(100.0)	0(0.0)	
Role Played in Institution				
Librarian	2	1(50.0)	1(50.0)	
University Lecturer	29	20(69.0)	9(31.0)	
Researcher	23	18(78.3)	5(21.7)	0.358

Students	35	19(54.3)	16(45.7)
Others	11	6(54.5)	5(45.5)

Table 4: Association between preprint promotion in institutions and socio-demographics of the participants (n=100)

Variables	No examined	Yes N(%)	No N(%)	Pvalue
Country				
Rwanda	16	10(62.5)	6(37.5)	
South Africa	1	0(0.0)	1(100.0)	
Kenya	6	4(66.7)	2(33.3)	
Zambia	9	1(11.1)	8(88.9)	
Zimbabwe	1	1(100.0)	0(0.0)	
Ethiopia	2	1(50.0)	1(50.0)	

Sierra Leone	1	0(0.0)	1(100.0)	
Benin	1	0(0.0)	1(100.0)	
Malawi	1	0(0.0)	1(100.0)	0.198
Nigeria	27	10(37.0)	17(63.0)	
Morocco	1	1(100.0)	0(0.0)	
Uganda	8	2(25.0)	6(75.0)	
Cameroon	7	1(14.3)	6(85.7)	
Somalia	4	3(75.0)	1(25.0)	
Losotho	2	0(0.0)	2(100.0)	
Ghana	8	4(50.0)	4(50.0)	
Tanzania	5	2(40.0)	3(60.0)	
Research Domain				
Scientific Research	34	18(52.9)	16(47.1)	
Social Research	6	2(33.3)	4(66.7)	
Medical Research	48	15(31.3)	33(68.8)	
Educational Research	6	3(50.0)	3(50.0)	0.209
Business Research	3	2(66.7)	1(33.3)	
Others	3	0(0.0)	3(100.0)	
Highest Level of Education				
Undergraduate	25	15(60.0)	10(40.0)	
Masters	55	34(61.8)	21(38.2)	
Doctor of Philosophy (PhD)	13	8(61.5)	5(38.5)	
Post Doctorate	2	2(100.0)	0(0.0)	
Others	5	5(100.0)	0(0.0)	
Role Played in Institution				
Librarian	2	1(50.0)	1(50.0)	
University Lecturer	29	20(69.0)	9(31.0)	
Researcher	23	18(78.3)	5(21.7)	

Students	35	19(54.3)	16(45.7)	
Others	11	6(54.5)	5(54.5)	

Table 4: Association between preprint usefulness in the role played in their institution and socio-demographics of the participants (n=100)

Variables	No Examined	Yes N(%)	No N(%)	I Don't Know N(%)	Pvalue
Country					
Rwanda	16	11(68.8)	3(18.8)	2(12.4)	
South Africa	1	1(100.0)	0(0.0)	0(0.0)	
Kenya	6	6(100.0)	0(0.0)	0(0.0)	
Zambia	9	2(22.2)	2(22.2)	5(55.6)	
Zimbabwe	1	1(100.0)	0(0.0)	0(0.0)	

Ethiopia	2	2(100.0)	0(0.0)	0(0.0)	
Sierra Leone	1	1(100.0)	0(0.0)	0(0.0)	
Benin	1	1(100.0)	0(0.0)	0(0.0)	
Malawi	1	1(100.0)	0(0.0)	0(0.0)	0.325
Nigeria	27	14(51.9)	7(25.9)	6(22.2)	
Morocco	1	0(0.0)	0(0.0)	1(100.0)	
Uganda	8	5(62.5)	1(12.5)	2(25.0)	
Cameroon	7	3(42.9)	1(14.2)	3(42.9)	
Somalia	4	4(100.0)	0(0.0)	0(0.0)	
Losotho	2	0(0.0)	0(0.0)	2(100.0)	
Ghana	8	7(87.5)	0(0.0)	1(12.5)	
Tanzania	5	3(60.0)	1(20.0)	1(20.0)	
Research Domain					
Scientific Research	34	24(70.6)	4(11.8)	6(17.6)	
Social Research	6	4(66.7)	0(0.0)	2(33.3)	
Medical Research	48	25(52.1)	10(20.8)	13(27.1)	0.640
Educational Research	6	5(83.3)	0(0.0)	1(16.7)	
Business Research	3	2(66.7)	1(33.3)	0(0.0)	
Others	3	2(66.7)	0(0.0)	1(33.3)	
Highest Level of Education					
Undergraduate	25	14(56.0)	5(20.0)	6(24.0)	
Masters	55	36(65.5)	7(12.5)	12(21.8)	
Doctor of Philosophy (PhD)	13	8(61.5)	1(7.7)	4(30.8)	0.861
Post Doctorate	2	1(50.0)	1(50.0)	0(0.0)	
Others	5	3(60.0)	1(20.0)	1(20.0)	
Role Played in Institution					
Librarian	2	2(100.0)	0(0.0)	0(0.0)	

University Lecturer	29	17(58.6)	3(10.3)	9(31.0)	
Researcher	23	17(73.9)	4(17.4)	2(8.7)	0.586
Students	35	19(54.3)	7(20.0)	9(25.7)	
Others	11	7(63.6)	1(9.1)	3(27.3	

Qualitative Analysis

What would you like to learn about preprints?

This study reported participants' interest in preprints. The identified areas of interest included learning about preprints, the process required for preprinting papers, the benefits of preprints, the available platforms for preprinting, the differences between preprints and peer-reviewed papers, the role of preprints in facilitating collaboration, and the acceptance of preprints within the scientific community. However, some participants were unfamiliar with the concept of preprints and expressed a desire to understand what it entails. They expressed:

A participant from XXXXX

"*What are preprints and how do they differ from peer-reviewed articles? How can articles for preprints be evaluated for credibility and quality?*".

A participant from XXXXX

"*I want to know about the roles of Preprint in improving the research pool in Africa.*"

Ways to increase preprint uptake in your institution?

In this study, the participants identified several ways to promote preprint adoption. These include creating awareness about preprints among lecturers and students, providing information on the benefits of preprints—such as making research accessible to those unable to afford article processing fees in traditional journals—and advocating for preprints within institutions. Participants suggested recognizing preprints as materials that contribute to the promotion of lecturers, providing rewards and recognition for preprinting papers, establishing preprint clubs within institutions, and organizing conferences and workshops on preprints.

A participant from XXXXX

"*Offer rewards or recognition for researchers who publish preprints, such as bonuses, promotions, or public acknowledgment.*"

A participant from XXXXX

"*By promoting educational workshops and seminars, engaging with senior researchers, creating a preprint repository, and facilitating networking opportunities.*"

A participant from XXXXX

"*Workshops: Host workshops and seminars explaining what preprints are, their benefits, and the submission process. This can help demystify the concept for researchers who may be unfamiliar with it. Encourage early-career researchers: Support early-career researchers and graduate students in using preprints as a way to increase their visibility and build their research profile. Offering guidance and support could be particularly beneficial*."

What can be done to ensure the credibility and quality of research shared through preprints in the African context?

In this study, the participants identified several ways to ensure the credibility and quality of preprinted papers. These include creating guidelines or instructional materials to guide the preprinting process, recognizing credible platforms for preprinting papers, offering a review

process to ensure community evaluation of preprinted papers, and establishing committees to oversee preprinted submissions. Participants also emphasized the importance of having clear guidelines on ethical practices, appropriate methodology, data dissemination, and sharing. Additional suggestions included training researchers on the preprinting process and its benefits and promoting institutional support for preprints.

A participant from XXXXX

"*To ensure the credibility and quality of preprints in Africa, several measures can be implemented. Firstly, African researchers should use trusted Preprint repositories like bioRxiv or regional platforms such as AfricaRxiv, which have quality control mechanisms in place. Introducing informal peer review processes or community feedback on these platforms can further enhance quality. Secondly, promoting transparency by encouraging researchers to share data, methodologies, and code with their preprints will ensure reproducibility and build trust. Thirdly, training programs on research integrity and preprint submission should be offered to researchers, especially early-career scientists, to improve submission quality. Fourthly, fostering collaborations with international research networks and local mentorship will elevate research standards. Finally, establishing African-based preprint platforms with regional oversight and ethical compliance standards will ensure local relevance and rigorous quality checks. These strategies will help build a credible, high-quality Preprint culture across Africa.*"

A participant from XXXXX

"*More reviews of preprints by peers before sending to journals; implementing rigorous submission standards for preprints by adopting well-defined quality guidelines; and encouraging post-publication peer review where readers can provide feedback and suggestions for improving the preprint*."

A participant from XXXXX

"*Implementing voluntary peer review through encouraging preprint servers to offer options for voluntary peer review or community review, where other researchers can provide feedback, enhancing the credibility of the research before formal publication. Establishing local preprint moderation committees of experienced researchers to moderate preprints in specific disciplines,*

ensuring that submissions meet basic standards of quality, rigor, and ethics. Developing clear ethical and methodological Guidelines Providing comprehensive guidelines on ethical research practices and robust methodologies, encouraging researchers to follow rigorous standards before submitting their work as preprints. Promoting transparent data and method sharing by encouraging researchers to include detailed methodologies, data sources, and analyses in their preprints, allowing other scientists to assess the work's validity. Transparency, improving trust in the research quality. Encouraging institutional and funding body endorsements to endorse preprints as part of a researcher's output but require adherence to specific quality standards. This support can guide researchers toward high-quality submissions'.

Increasing the awareness and adoption of preprint platforms among researchers and academics in Rwanda and across Africa?

To increase the awareness and adoption of Preprint platforms, some participants gave some credible strategies that can assist in its promotion:

A participant from XXXXX

"*To increase awareness and adoption of preprint platforms in Rwanda and Africa, a multifaceted approach is needed. Firstly, universities and institutions should organize workshops and webinars to educate researchers about the benefits of preprints, such as faster dissemination and increased visibility. Institutions can also integrate preprints into their academic policies, recognizing them in promotions, tenure, and funding evaluations. Secondly, highlighting success stories from local researchers who have benefited from preprints can encourage peers to follow suit. Collaborations with global and regional networks like AfricaRxiv can provide technical support and build trust in preprint platforms. Improving internet access and providing local language training on how to submit preprints will address logistical barriers. Finally, engaging early-career researchers and students in preprint practices through academic programs will foster long-term adoption. Together, these strategies can significantly increase preprint uptake across Africa*."

A participant from XXXXX

1. ***"Organize Workshops and Training Programs****: Conduct in-person and virtual workshops on preprints at universities, research institutions, and conferences. These sessions can cover how to submit preprints, their benefits, and how to use them for faster dissemination and feedback."*

2. ***"Incorporate Preprints into Academic Curriculum****: Introduce modules on preprints and open-access publishing within postgraduate and doctoral programs. Teaching students about preprints early in their academic careers normalizes the practice and builds familiarity."*

3. *"**Highlight Success Stories and Case Studies**: Showcase African researchers who have successfully used preprints to advance their research, gain collaborations, or improve visibility. Sharing these success stories can help other researchers see the practical value of preprints."*

4. ***"Leverage Institutional and Government Support****: Encourage universities and research institutions to formally recognize preprints as valuable academic outputs, and collaborate with government bodies to include preprints in national research assessments and funding applications."*

5. *"**Engage Research Networks and Professional Associations**: Collaborate with professional associations and networks to promote preprints, as these groups are influential and can provide endorsements, training, and resources to their members."*

6. ***"Partner with Popular Preprint Servers****: Form partnerships with major preprint platforms to increase access and visibility for African researchers. Some platforms could offer dedicated African research sections or resources specifically tailored to African contexts."*

Discussion

The extent to which preprinting has been embraced globally varies noticeably. This might result from disparities in how different nations embrace and carry out open research legislation or from

differing degrees of awareness regarding preprinting (7). This is evident in this study reporting 64% awareness of preprint among participants surveyed in African regions. However, only 42% acknowledge institutional uptake. These differential findings in awareness and institutional uptake revealed that people might be more aware of the availability of Preprint through various research collaborations, conferences, and workshops, but the awareness is not from the institution they are affiliated with. A study conducted by David et al. (7) revealed a moderate (41%) preprint posting prevalence among African researchers, highlighting the expanding global trend of researchers choosing not to publish their work as preprints before formal peer review.

However, this study highlighted that despite the low institutional uptake of preprints, 62% of the participants recognized the relevance of preprints to their roles in their institutions. A study conducted by Soderberg et al. (3) among researchers revealed that only 5.43% of the participants reported no awareness of preprints, leaving larger participants to be aware of the preprint with a good percentage of the uptake of preprint (69.73%). The higher awareness and acceptance as compared to our study might be because most of their participants were from very high/high Human Development Index (HDI) and the United States and Western European countries (3). This revealed that despite the acceptance of preprint in developed countries, Africa is still coming to the reality of embracing it. Despite the benefits of preprint to university repositories, notable universities in Nairobi, Kenya, and Dar es Salaam, Tanzania, are among the few that have expressed interest in collaborating with AfricArXiv (8).

Despite the benefits of preprints in quick dissemination of research (9-11), this study reported that most participants (53%) acknowledged that the lack of recognition of preprints in the scientific community hinders the adoption of preprints in African institutions. This revealed the skepticism around the credibility of preprints stands as an obstacle to the embracing of it in Africa. A scoping review conducted by Blatch-Jones et al. (2) revealed that several studies reported that preprints are believed to be lacking in scientific integrity, credibility, and quality, and editors, publishers, journals, and researchers continue to express hesitancy over the function of preprints and their scientific value. The participants' viewpoints in this study on improving the credibility of preprint centered around having clear guidelines on ethical practices, appropriate methodology, data dissemination, and sharing, recognizing credible platforms for preprinting papers, offering a

review process to ensure community evaluation of preprinted papers, and establishing committees to oversee preprinted submissions. Adopting this credible insight tends to lead to the acceptance of preprint in African institutions.

This study reported high awareness levels in countries like Uganda, Nigeria, and Rwanda, while it was absent in Benin and Malawi. Although the promotion seems to be much higher in countries like Zimbabwe and Somalia, Nigeria shows a moderate promotion. The difference in the level of awareness might be due to the low number of participants recruited and the concentration of participants recruited in Nigeria and Rwanda. However, this study also reported high awareness among those in medical, scientific, and business fields, but a low awareness was seen among researchers in the social fields. Funnily, scientific research is reported to promote preprint, and medical research fields show a lower rate of promoting preprint. In a study conducted by Ni & Waltman (12) across the world, they reported that physics and astronomy are the fields that use preprinting the most, followed by computer science and mathematics. In other fields of study like medical, health, and social research, it is far weaker, as preprinting is something that many scholars in other fields are somewhat familiar with.

Across the academic level, preprint awareness and promotion were higher among the postdoctoral level, and a notable level of awareness was also seen among undergraduate and master students. However, Soderberg et al. (3) reported that graduate students and postdocs showed the highest level of favorability. These revealed that owing to the involvement of these educational levels in this research as an earlier career researcher, they tend to be eager to get their work disseminated on time to build more on their career and increase the chance for collaboration. This study also reported that researchers and university lecturers are more aware of preprint and tend to promote preprint dissemination.

Based on the perceived relevance of preprint across the socio-demographics of the participants, Kenya, Somalia, and Ethiopia reported a high preprint relevance rate, while Zambia and Cameroon showed lower levels. This might be influenced by the low participation of the countries in the needs assessment owing to a low sample size. Despite the higher perceived relevance in the fields of science and education, medical research perceived lower relevance to their fields. Chung (13)

perceived that the reason for lower relevance in medicine might be that interest groups or pharmaceutical firms seeking secondary profits may misuse non-peer-reviewed preprints if they are thought to be a source of scientifically solid material. In contrast to other academic disciplines like physics and mathematics, the public and media frequently do not distinguish between preprints and journal publications when discussing the results of medical research. Publications about medical diagnosis and treatment require extra caution when being examined. Even after peer review and clearance by health authorities, more detrimental impacts are frequently discovered. Therefore, if a stakeholder decides to act on information in a preprint, the quality of which has not been ensured, the preprint may inflict genuine harm and injury (13). However, postdoctoral and master students, and those serving as researchers and university lecturers, have higher thoughts on preprint relevance.

In promoting preprint in African institutions, this reported the participants' insight to promoting preprint in several ways, which include creating awareness about preprints among lecturers and students, providing information on the benefits of preprints—such as making research accessible to those unable to afford article processing fees in traditional journals—and advocating for preprints within institutions, incorporating preprints into the academic curriculum, engaging research networks and professional associations, partnering with popular preprint servers, organizing workshops and webinars to educate researchers about the benefits of preprints, such as faster dissemination and increased visibility, and highlighting success stories from local researchers who have benefited from preprints, collaborating with global and regional networks like AfricaRxiv to provide technical support and build trust in preprint platforms, improving internet access and providing local-language training on how to submit preprints. This is believed to improve the awareness and promotion of preprint in African institutions.

Strengths and limitations of the study

The study employed a mixed study design that captures the awareness and promotion of preprints in Africa and leverages their experience, thoughts, and perception, which brings the current status of preprints in Africa into the limelight. However, this study is limited by a low sample size, as it poses a bias to our findings. This reflects the need for a wider African institutional study that can

reveal the socio-demographic factors posing a barrier to promoting the uptake of preprint in African institutions.

Conclusion

This study, to an extent, revealed the state of preprint in the African schorlaly and research community. It showed that preprint, though known among researchers, academia, and students, has not been fully embraced. The issues of credibility and quality are the major concerns regarding preprint usage. It is obvious from this study that preprint will be intensively adopted and utilized by many if its credibility is assured and it is indexed by servers like PubMed, Scopus, and others.

To further promote the use of preprint in the African community, it is crucial to engage individuals in diverse fields through awareness creation, organize preprint training or workshops at different capacity levels, promote funding opportunities, and create a friendly but educative platform for preprint discussions and feedback.

Recommendation

An increase in awareness creation regarding preprint across several African institutions stands as a great chance of increasing preprint acceptance and uptake, which boosts its relevance and credibility in the African Community. Constructive and sincere feedback from the preprint reviewers should be encouraged, as it provides a means of benefit to early-career researchers. Strengthening collaborations with high-impact journals on preprint reviews and publications will help to improve its credibility and the uptake of preprint. Also, leveraging the participants' suggestions and recommendations highlighted in the results is very critical in preprint promotion in Africa.

Declarations

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Ethical Approval

Not Applicable

Consent to Participate

All participants gave their consent to participate in the research work.

Consent for Publication

Not Applicable

Data Availability

All data generated in this study have been embedded within the manuscript.

Conflict of Interest

Authors declare no conflict of Interest

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This study received financial support from ASAPbio

Authors Contribution

OIE led the research work, manuscript drafting, data collection, and contributed to proofreading and revising the manuscript. TJO assisted with manuscript drafting and data collection and participated in proofreading and revising the manuscript. RDD conceptualized the idea, provided supervision, and contributed to editing and proofreading the manuscript.

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