Changes in Knowledge, Practices, and Perceived Importance of Open Science Following a Training Program for Latin American Researchers

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Abstract

Open Science (OS) has gained prominence as a framework for more transparent and equitable research, but few studies have directly examined the barriers faced by researchers in Latin America. Understanding these obstacles is crucial not only to systematize the challenges to OS implementation but also to design and evaluate targeted training initiatives that address them. In this study, we combined qualitative and quantitative approaches to examine the perspectives of Spanish-speaking researchers participating in an OS training program. Thematic analysis of open-ended responses allowed us to categorize perceived barriers into four domains: cultural resistance and perceived risks, knowledge and training gaps, structural limitations, and institutional constraints. Quantitative analyses using cumulative link mixed models revealed that participation in the training was associated with significant increases in knowledge and implementation of OS practices, along with higher ratings of their perceived importance. Together, these results show that training interventions can help mitigate some of the reported barriers, while also providing systematic evidence to guide policies and institutional reforms needed for sustainable OS adoption in the region.

Introduction

UNESCO (1) defines open science (OS) as a set of principles and practices aimed at making scientific research across disciplines accessible to all, benefiting both the scientific community and society as a whole. This is articulated across multiple dimensions, such as open access to publications, open data aligned with the Findable, Accessible, Interoperable, and Reusable (FAIR) principles, open software and code, methodological transparency, citizen science, open peer review, and collaborative practices.

In Latin America, OS has developed mainly through pioneering, non-commercial open-access journals and publications (2), with regional initiatives such as SciELO, Redalyc, CLACSO, and LA Referencia, which provide non-commercial and decentralized infrastructures (3,4). These platforms have been fundamental in making local scientific production visible, partly counteracting the dependence on hegemonic editorial circuits. Several countries have advanced in the design of specific laws and programs. In 2013 in Argentina, Law 26,899 established the obligation of open access to publications funded with public resources, complemented by open data programs (Resolutions 753-E/2016 and 640/2017). Similar processes have taken place in Brazil, where since 2011 the Repositório Nacional (Deposita) has been consolidated and OS guidelines promoted through the Fundação Oswaldo Cruz and IBICT; in Chile, with the implementation of institutional repositories and guidelines promoted by CONICYT and the Library of Congress; in Colombia, with the guidelines of Colciencias and the Colombian Scientific Information Network; in Mexico, with the creation of the National Repository under the National Council of Science and Technology (CONACYT); and in Peru, where RENARE coordinates institutional open access repositories. In Uruguay, the National Agency for Research and Innovation (ANII) has promoted digital open-access repositories, although with a less normative scope (5). Nevertheless, the regional landscape shows wide disparities. While countries such as Brazil, Argentina, Chile, Colombia, and Mexico have enacted national open access laws, created mandatory digital repositories, and launched national or regional platforms, the developments in other countries are more fragmented, limited to institutional initiatives without a strong national framework (4,5).

In the medium to long term, OS is expected to enhance scientific productivity. Increased collaboration avoids unnecessary duplication of efforts and facilitates the use of a shared pool of knowledge and cognitive resources (6). Including a wider range of contributors—whose time and cognitive capacities were previously unavailable—also reduces research costs and accelerates processes (7). Additionally, citizen participation not only increases available resources but also contributes to the democratization of knowledge (8). Finally, science can better address societal needs through systematic engagement with communities (9,10).

Although most researchers report favorable attitudes toward OS and express support for its principles, the actual implementation of concrete practices remains relatively low. Empirical studies show that while open access publishing is increasingly common, practices such as data sharing, preregistration, or open peer review are still rare (11–15). Several studies have identified significant barriers to the implementation of OS, such as the misalignment between OS and traditional academic incentive structures, which continue to privilege publications in high-impact journals over open outputs or do not reward open research practices in career advancement (11,13,14); legal and ethical concerns, particularly around data protection, copyright, and intellectual property (14); and an already established cultural resistance to change (15). At the same time, structural obstacles such as lack of resources and infrastructure–including limited funding to cover publication fees, inadequate repositories, and insufficient technical support–together with persistent gaps in training and awareness (12,13), further limit the extent to which researchers can translate positive attitudes toward OS into concrete practices.

Regarding OS intervention initiatives, Dudda et al. (16) carried out a mapping review of the literature, finding 105 studies in 86 articles, mostly carried out by journals, government agencies, or scientific research training institutions, with an overrepresentation of health and behavioral sciences. Interventions ranged from editorial policies, rewards and incentives, to training. Fifteen studies directly measured the effect of an intervention on reproducibility or replicability, while the majority of studies addressed other outcomes such as reporting checklists or perceptions of transparency. Dudda et al. (16) notice that most of them had a positive conclusion. In addition, it should be noted that most were carried out in the context of well funded science systems in USA or Europe. Among the few published initiatives in Latin America, for example, Cenci et al. (17) carried out a pre-post study with a training program on OS and responsible research practices: an intervention with graduate students at a Brazilian university as participants. Results showed that the training fostered more favorable perceptions and stronger intentions to engage in OS practices in the future. This finding underscores the importance of capacity-building initiatives as a first step in creating awareness and motivation among researchers.

Building on these findings, the present study seeks to advance the understanding of OS in Latin America by combining qualitative and quantitative approaches. Specifically, it has three main objectives: (a) to identify the main barriers to the implementation of OS among Spanish-speaking Latin American researchers; (b) to assess the impact of a training program on participants' knowledge of OS practices; and (c) to examine changes in the perceived importance attributed to these practices after the intervention. The first objective was addressed through a qualitative analysis of free-text responses to the question "What are some of the possible barriers or challenges that researchers in your discipline might face when adopting OS practices?" Using an inductive, semantic thematic approach, we categorized and synthesized the barriers reported by participants. The second and third objectives were evaluated through a pre- and post-intervention questionnaire, allowing for the examination of changes in both knowledge and perceived importance of OS practices. By integrating qualitative insights with quantitative analyses, this mixed-methods design provides a comprehensive picture of the contextual factors that shape OS adoption in Latin America, and offers empirical evidence to inform future training and policy initiatives in the region.

Materials and Methods

Participants

Participants were researchers who had registered for an online OS training program. Among the 217 individuals enrolled who provided consent for their data to be used, 167 (76.9%) completed the pre-training questionnaire, which included an open-ended question about barriers to implementing OS. These responses were analyzed qualitatively. A total of 106 participants (48.8%) completed both the pre- and post-training questionnaires and were included in the quantitative analyses. All participants were adults, and participation was voluntary and anonymous. An electronic informed consent form was provided as the first page of the online survey. The consent form explicitly stated that participation was anonymous, voluntary, and that responses would be used for analysis, publication, and dissemination in open repositories.

Personal information (full name, email address, and ORCID) was collected solely for course registration purposes. To link pre- and post-training responses, ORCID identifiers were used. All identifying information was permanently deleted after the analyses were completed, ensuring that the dataset stored in public repositories contained no personally identifiable information. Participants could withdraw at any point without completing the survey.

Materials

Data were collected using a structured questionnaire that combined closed- and open-ended items. Closed-ended items included demographic and professional background; knowledge and implementation of specific OS practices, measured with three ordered options: I am not familiar with this practice, I know about this practice but have never implemented it, and I have implemented this practice; perceived importance of OS practices, rated on a 5-point Likert scale ranging from not important to very important.

Open-ended items invited participants to describe, in their own words, barriers and challenges that researchers in their field may face when adopting OS practices.

Content validity was established through expert review within the project team prior to administration. All materials can be found at 10.17605/osf.io/kmsrj

Procedure

The study employed a mixed-methods pre–post design. Its qualitative component comprised open-ended responses collected at the pre-test phase and were analyzed thematically to identify perceived barriers to OS. Responses were reviewed, coded, and categorized into recurring themes, including linguistic barriers, institutional constraints, and structural limitations. This qualitative strand provided contextual depth to the quantitative findings by showing how participants described challenges in their own words.

Quantitative component: Participants completed an online baseline survey before the beginning of the training program. The same instrument was administered after the program's completion, allowing for paired comparisons across time points.

Training program: The intervention consisted of ALTa Ciencia Abierta, a training program on OS, adapted from NASA's asynchronous online course OS 101 (18). Whereas the original NASA course was delivered in English and designed for self-paced study, the adaptation by MetaDocencia tailored the contents to Spanish-speaking researchers in Latin America, incorporated regional examples, and was delivered synchronously in a fully online and free format. The program comprised six weekly sessions. The first five sessions covered the modules from NASA's curriculum–principles of OS (19), open tools and resources (20), open data (21), open code (22), and open results (23)–while an additional sixth plenary session was developed specifically for this program. In this final session, participants engaged with colleagues and representatives from different communities to showcase OS initiatives and foster networking and community building. Pedagogically, the program emphasized active learning strategies. Each weekly session was organized into three instructional modules and included two formative assessments, small-group discussions in breakout rooms, and one summative evaluation at the end of the course. The instructional design was guided by the principles outlined in Teaching Tech Together (24), ensuring a focus on learner-centered approaches and reproducible teaching practices.

The course materials were co-created by an interdisciplinary team of 19 researchers and educators from multiple Latin American countries, with the explicit aim of situating OS training in the regional context and addressing local challenges and opportunities.

This study was reviewed and approved by the Responsible Conduct of Research Committee of the Faculty of Psychology at the University of Buenos Aires (approval code: CEI24016).

Data Analysis

Qualitative analysis. Open-ended responses regarding barriers to OS were analyzed using thematic content analysis (25) following an inductive and semantic approach(26). Responses were coded inductively by two members of the research team, who identified recurrent categories such as linguistic barriers, institutional limitations, structural challenges, and perceived risks. Discrepancies were discussed until consensus was reached. Frequencies and percentages of respondents mentioning each theme were reported to provide an overview of the most salient barriers.

Quantitative analysis. Descriptive statistics were used to summarize the data. For categorical variables, results are reported as frequencies and percentages. For continuous variables, results are reported as means, standard deviations, and 95% confidence intervals. Pre–post changes in knowledge and perceived importance of OS practices were examined using cumulative link mixed models (CLMMs) with a logit link.

For knowledge and implementation, the dependent variable was ordinal with three levels (i.e., “I am not familiar with this practice”, “I know about this practice but have never implemented it”, and “I have implemented this practice”). For perceived importance, the dependent variable was ordinal with five levels (i.e., “not important” to “very important”). In both sets of models, the primary predictors were evaluation time (pre vs. post), practice type, and their interaction. Because each participant provided responses at two time points (pre and post) and across multiple practices, the data had a repeated-measures structure. A random intercept for participant ID was therefore included to account for the non-independence of observations.

Model selection followed a hierarchical strategy. First, a null model including only a random intercept was estimated. Next, evaluation time was added as a fixed effect, followed by practice type, and finally the interaction between evaluation and practice. Likelihood ratio tests were used to compare nested models, and the most parsimonious model that significantly improved fit was retained. Odds ratios (ORs) with 95% confidence intervals (CIs) were computed from the final models to facilitate interpretation. The proportional odds assumption was tested using Likelihood ratio tests on the corresponding cumulative link models without random effects. No violations were detected, supporting the use of proportional odds specifications. Following Christensen (27), the final models were therefore fitted using CLMMs. Pairwise comparisons between practices were estimated using

Tukey-adjusted multiple comparisons. Results were computed on the log-odds scale and reported as odds ratios with 95% confidence intervals.

To examine the robustness of the main findings, we conducted a sensitivity analysis in which the ordinal response categories were converted into numeric scores and summed up (i.e., knowledge and implementation: 1-3; importance: 1-5). Pre-post differences for global measures (i.e., knowledge and perceived importance) and differences between individual practices were tested using the Wilcoxon signed rank test. To account for multiple comparisons across practices, p-values were adjusted using the Bonferroni correction. The results of these analyses were consistent with the main CLMM findings and are not reported.

All analyses were conducted in R 4.5.1 (28) using the packages ordinal (27) and emmeans (29).

Results

The largest groups of participants were based in Argentina (n = 46, 43.4%), Ecuador (n = 14, 13.2%), and Mexico (n = 10, 9.4%). The majority identified as female (n = 60, 56.6%), followed by male (n = 44, 41.5%). Regarding educational attainment, just over half of the sample reported having completed a postgraduate degree (n = 55, 51.9%), and 32.1% (n = 34) completed undergraduate education. Most common fields of study were the natural and exact sciences (n = 33, 31.1%), engineering, technology, and architecture (n = 25, 23.6%), and the social sciences (n = 21, 19.8%). Other participants reported training in health sciences, humanities, or other fields.

Most participants (n = 85, 80.2%) reported being actively involved in research. For this subgroup, the mean length of professional experience was 8.42 years (SD = 8.14, 95% CI [6.67, 10.20]), with values spanning from 1 to 48 years.

Perceived Barriers to the Implementation of OS

Thematic analysis revealed four main categories of perceived barriers to the implementation of OS: (1) perceived risks and cultural resistance, (2) knowledge and training gaps, (3) structural limitations, and (4) institutional barriers. Table 1 summarizes the frequency of responses in each category along with illustrative quotes from participants.

Table 1. Categories of Perceived Barriers to Implementing Open Science Identified in the Thematic Analysis

Category	Main points	Examples of incidents	n (%)
Perceived risks and cultural resistance	● Resistance due to adherence to traditional practices ● Concerns about ethical and legal issues, such as misuse of sensitive data ● Fear of competition and plagiarism	"[…] the traditional academic culture that favors competition over collaboration." "Some people prefer an elitist and exclusive science." "I have observed cases of plagiarism, lack of credit, and intellectual appropriation." "[...] it must be considered that [the data] may contain sensitive information which, if released openly, could have legal and social implications."	61 (36.5%)
Knowledge and training gaps	● Lack of knowledge regarding specific practices or resources. ● Insufficient training	"I had no training or guidance. Everything I learned was on my own and only superficially." "Lack of knowledge about publication platforms and lack of clear information on how to share data."	51 (30.5%)
Structural	● Lack of economic	"[…] spending more time and resources	65 (38.9%)

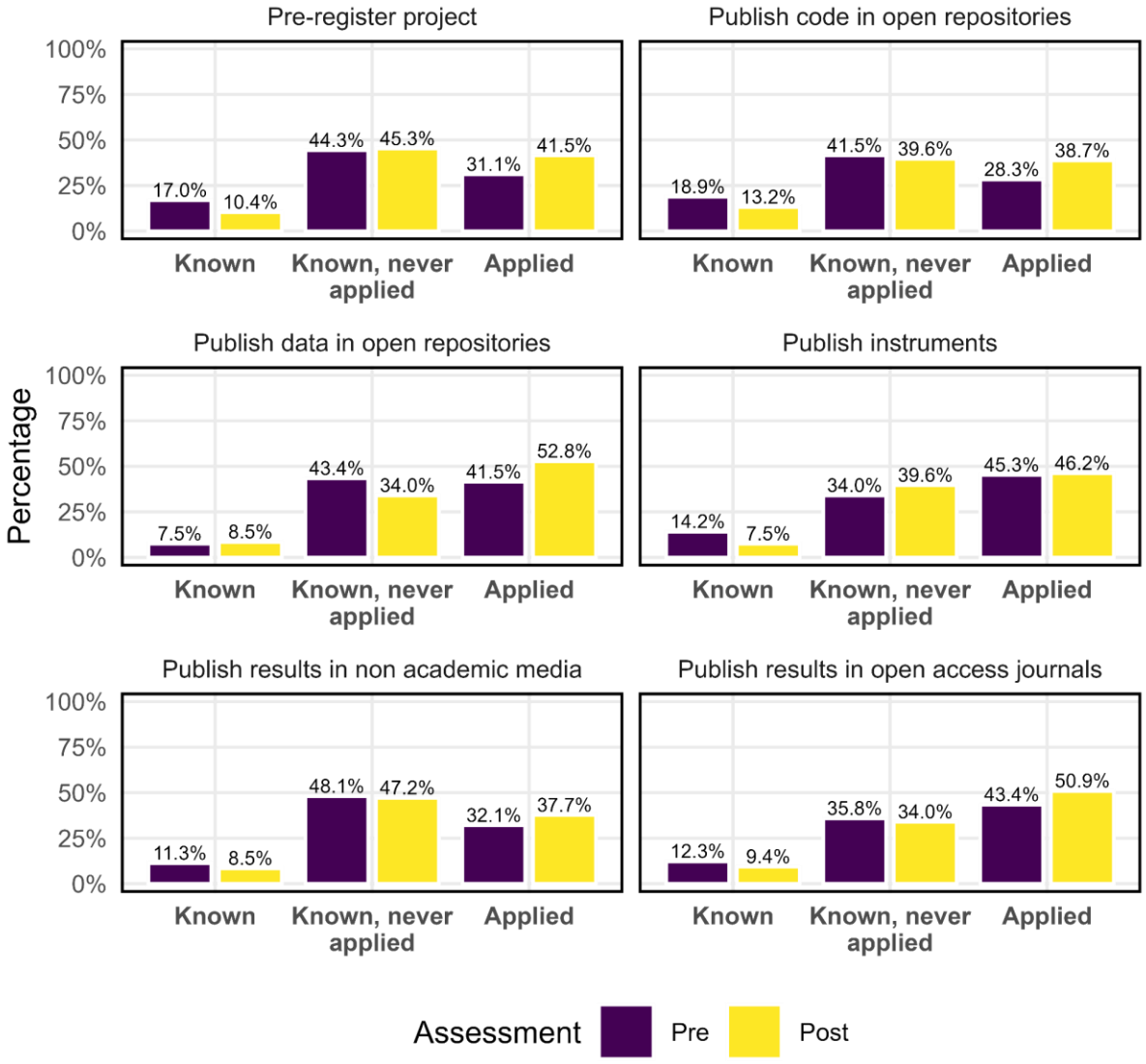
limitations	and technological resources ● Lack of time and heavy workload for researchers ● Language barriers limiting participation in global OS initiatives	in a precarious situation, which creates a disadvantage." "One of the greatest challenges is the high cost of open access publication in high-impact journals." "When choosing to publish in Spanish and in open-access journals without fees, there are far fewer indexed options available." "Most repositories are not available in Spanish"	
Institutional barriers	● Lack of academic incentives ● Absence of clear supporting policies	"There are no budgets or time allocated to make research open." "[…] the lack of academic recognition for sharing data and publications [openly]." "[When institutions evaluate researchers] publishing in high-impact journals is prioritized over data sharing."	32 (19.2%)

Knowledge, Implementation, and Perceived Importance of OS Practices

Before the training, participants reported varying degrees of familiarity and application across different OS practices. Although a complete lack of knowledge was relatively uncommon, there were notable differences in how practices were positioned along the continuum from "knowing but not applying" to "having applied." Practices such as publishing in open access journals and sharing data

were more frequently reported as already applied, while preregistration and data management plans were less often practiced and more often known without application (Fig 1).

Fig 1. Observed distribution of knowledge about OS practices before and after training



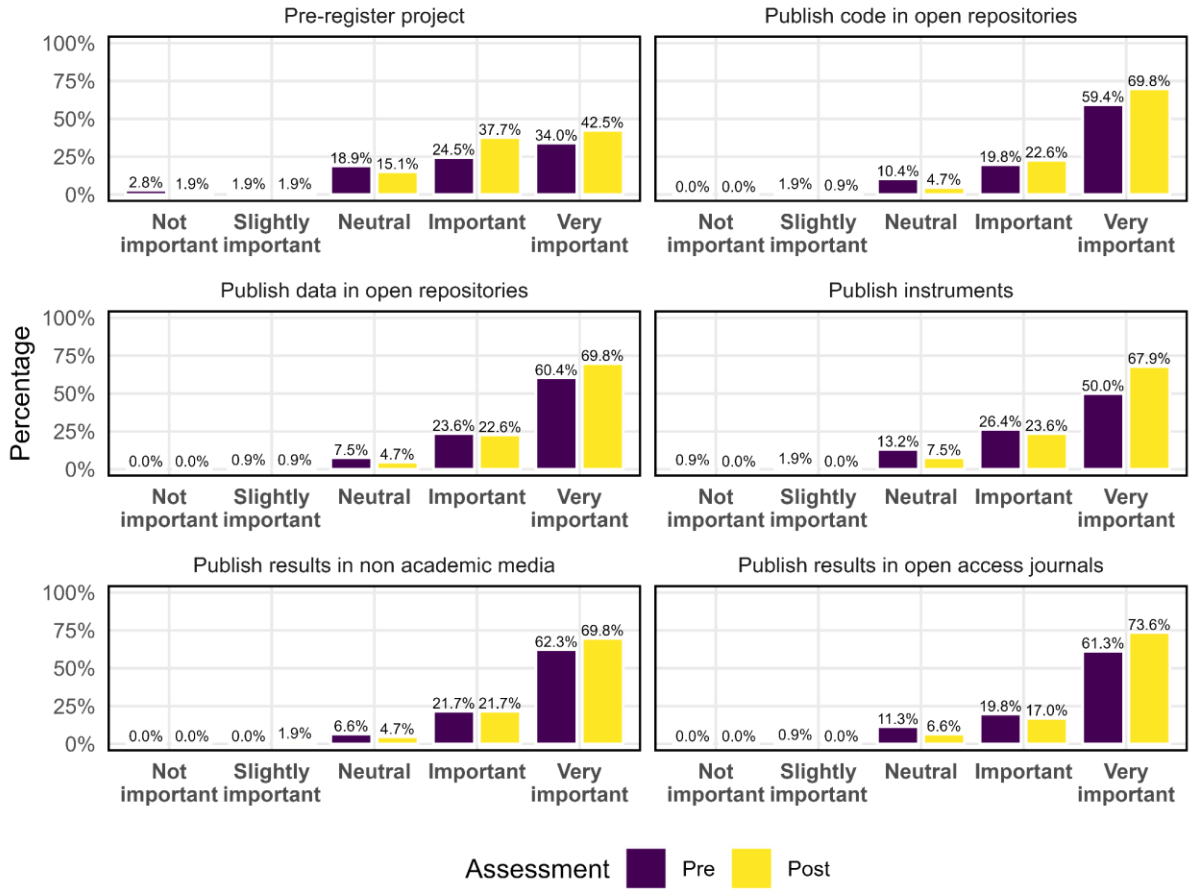
To assess the significance of predictors, CLMMs were compared hierarchically. The null model (random intercept only) was significantly improved by the inclusion of evaluation time ($\chi^2(1) = 17.8$,

$p < .001$, $\Delta AIC = 15.8$), and further improved by the addition of practice type ($\chi^2(5) = 25.8$, $p < .001$, $\Delta AIC = 15.8$). However, adding the interaction between evaluation and practice did not improve model fit ($\chi^2(5) = 1.4$, $p = .93$, $\Delta AIC = -8.6$). Therefore, the final model retained main effects of evaluation and practice, but not their interaction, indicating that although knowledge increased from pre- to post-test overall, the magnitude of change did not differ significantly across practices.

The final model showed a significant main effect of evaluation, with participants more likely to report greater knowledge and implementation post-training compared to pre-training (OR = 1.72, 95% CI [1.34, 2.20], $p < .001$). Publishing open code was associated with lower levels of knowledge and implementation than publishing open data (OR = 0.44, 95% CI [0.24, 0.81], $p < .01$), research instruments (OR = 0.51, 95% CI [0.28, 0.94], $p = .02$), and results in open access academic journals (OR = 0.48, 95% CI [0.26, 0.89], $p < .01$). Additionally, preregistering a project associates with lower levels of knowledge than publishing data in open repositories (OR = 0.52, 95% CI [0.28, 0.94], $p < .01$). All other comparisons were not significant (see S1 Table).

Regarding perceived importance, the distribution of ratings for each OS practice before and after the training is presented in Fig 2.

Fig 2. Observed distribution of perceived importance about OS practices before and after training



Overall, ratings were already high at baseline, with most participants considering the practices as important or very important. After the training, this pattern became even more pronounced, with a further shift toward the highest category (very important), and fewer responses in the lower or neutral categories.

CLMMs were again compared hierarchically. The null model (random intercept only) was significantly improved by the inclusion of evaluation time ($\chi^2(1) = 7.9$, $p < .01$, $\Delta AIC = 5.9$), and further by the addition of practice type ($\chi^2(5) = 78.1$, $p < .001$, $\Delta AIC = 68.1$). Adding the interaction between evaluation and practice did not improve model fit ($\chi^2(5) = 4.9$, $p = .43$, $\Delta AIC = –95.4$). Thus, the final model retained main effects of evaluation and practice but excluded their interaction, indicating that the overall increase in perceived importance from pre- to post-test was consistent across practices.

The final model showed a significant main effect of evaluation, with participants more likely to rate practices as important or very important post-training compared to pre-training (OR = 1.54, 95% CI [1.18, 2.01], p = .001).

Pairwise comparisons between practices showed that preregistration of a project was rated as less important than publishing code in open repositories (OR = 0.23, 95% CI [0.12, 0.44], p < .001), data collection instruments (OR = 0.34, 95% CI [0.18, 0.64], p < .001), data (OR = 0.22, 95% CI [0.11, 0.41], p < .001), results in non-academic media such as blog posts and social media posts (OR = 0.20, 95% CI [0.10, 0.38], p < .001), and results in open access journals (OR = 0.20, 95% CI [0.11, 0.39], p < .001). All other comparisons were not statistically significant (see S2 Table).

Discussion

This study aimed to advance the understanding of OS in Spanish-speaking Latin America by identifying key barriers to its implementation and assessing the impact of a training program on participants' knowledge and perceived importance of OS practices. To explore barriers, we asked participants to describe the obstacles they faced, and thematic analysis grouped their responses into four categories: perceived risks and cultural resistance, knowledge and training gaps, structural limitations, and institutional barriers.

The most frequently reported theme concerned fears related to data and material sharing, particularly the risk of plagiarism, unfair competition, and misuse of sensitive information. Ethical and legal concerns were also highlighted, especially in research involving human participants. Similar anxieties have been described in contexts outside of Latin America. For instance, several studies highlight that efforts to increase transparency in research often conflict with the need to protect sensitive or human data, generating tensions around privacy, confidentiality, and the potential for data misuse (14,30). Resistance to changing established practices also emerged, consistent with findings by Pardo and Cotte (31), who observed limited integration between OS and more traditional research cultures.

Many participants emphasized a lack of time, funding, and technical support as critical barriers. These

structural constraints are consistent with barriers reported in Argentina (13) and outside of Latin America (32) and align with broader analyses highlighting how insufficient infrastructure and resources risk creating unequal and fragmented adoption of OS (33). Participants also referred to the absence of clear policies and, most importantly, to the lack of academic incentives. These findings are in line with concerns raised by Alessandroni and Byers-Heinlein (34) and Haven et al. (35), who argue that without reforms in research assessment systems, OS faces serious limitations in becoming standard practice. A significant proportion of responses also pointed to limited knowledge of platforms, repositories, and licensing frameworks, as well as insufficient training in OS practices, as noted by Benitez et al. (13) and Cenci (17). In addition, Ferpozzi (36) notes that without developing the necessary capacities to produce and apply knowledge locally, open science risks reinforcing existing asymmetries between centers and peripheries of scientific production, thus limiting the potential for a situated form of open science in Latin America.

Regarding the effect of the course, results indicated that participation in targeted training was associated with significant increases in knowledge and implementation of OS practices, as well as a shift toward higher ratings of perceived importance. This result is even more important given that quantitative analyses showed a relatively high baseline of knowledge and perceived importance of OS practices among researchers, probably because of the self-selection of the sample.

Our findings in Latin America align with broader evidence suggesting that researchers are generally supportive of OS ideals but encounter numerous barriers to implementation. Policies and infrastructures for open access publishing have been pioneered by and remain relatively strong in Latin America (3,4), yet empirical studies continue to identify gaps in training, institutional support, and incentives (15,37). Taken together, these findings underscore the need for multi-level interventions to advance OS. Training initiatives can raise awareness and foster individual engagement, but sustained adoption requires systemic changes in research assessment and support structures. As argued by Ràfols et al.(33), monitoring and evaluating OS as a systemic transformation demands moving beyond output-based indicators (e.g., publications, datasets) toward assessing processes (e.g., participation, co-creation) and values (e.g., equity, inclusion). In the Latin American

context, integrating training programs with supportive institutional policies could help bridge the gap between individual motivation and systemic constraints.

This study benefits from a pre-post design and the use of cumulative link mixed models to account for the ordinal nature of the data and repeated measures. Nevertheless, several limitations should be acknowledged. First, participation was voluntary among participants of an OS course and may reflect a selection bias toward researchers already interested in these practices. Second, the relatively short follow-up period precludes conclusions about long-term behavioral change. Third, self-reported measures of knowledge and implementation may overestimate actual adoption.

Future research should incorporate longitudinal designs to assess whether training effects are sustained over time, and whether they translate into measurable outputs such as increased preregistration, data sharing, or use of open peer review. Comparative studies across national contexts could also shed light on how differences in policy frameworks and institutional incentives shape training effectiveness. Finally, aligning monitoring efforts with UNESCO's systemic approach to open science (1,33) could provide a more comprehensive picture of progress, including societal outcomes and equity considerations.

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Supplementary materials

Sup1 Table. Pairwise odds ratios comparing knowledge and implementation across OS practices

Contrasts	OR	OR 95% CI		p-value
		Lower limit	Upper limit	
Pre-register project - Publish code in open repositories	1.18	0.64	2.15	0.97
Pre-register project - Publish data in open repositories	0.52	0.28	0.94	0.02
Pre-register project - Publish instruments	0.60	0.33	1.10	0.15
Pre-register project - Publish results in non–academic media	0.91	0.50	1.64	1.00
Pre-register project - Publish results in open-access journals	0.57	0.31	1.04	0.08
Publish code in open repositories - Publish data in open repositories	0.44	0.24	0.81	<.001
Publish code in open repositories - Publish instruments	0.51	0.28	0.94	0.02
Publish code in open repositories - Publish results in non-academic media	0.77	0.42	1.41	0.82

Publish code in open repositories - Publish results in open-access journals	0.48	0.26	0.89	0.01
Publish data in open repositories - Publish instruments	1.16	0.63	2.15	0.98
Publish data in open repositories - Publish results in nonacademic media	1.76	0.96	3.22	0.08
Publish data in open repositories - Publish results in open access journals	1.1	0.60	2.03	1.00
Publish instruments - Publish results in non-academic media	1.51	0.83	2.77	0.37
Publish instruments - Publish results in open access journals	0.95	0.51	1.75	1.00
Publish results in non-academic media - Publish results in open access journals	0.63	0.34	1.15	0.23

S2 Table. Pairwise odds ratios comparing perceived importance across OS practices

Contrasts	**OR**	**OR 95% CI**		**p-value**
		Lower limit	**Upper limit**	
Pre-register project - Publish code in open repositories	0.23	0.12	0.44	<.001
Pre-register project - Publish data in open repositories	0.22	0.11	0.41	<.001
Pre-register project - Publish instruments	0.34	0.18	0.64	<.001

Pre-register project - Publish results in non academic media	0.2	0.10	0.38	<.001
Pre-register project - Publish results in open access journals	0.2	0.11	0.39	<.001
Publish code in open repositories - Publish data in open repositories	0.94	0.48	1.83	1.00
Publish code in open repositories - Publish instruments	1.48	0.77	2.85	0.52
Publish code in open repositories - Publish results in non-academic media	0.85	0.43	1.68	0.98
Publish code in open repositories - Publish results in open-access journals	0.88	0.44	1.74	0.99
Publish data in open repositories - Publish instruments	1.58	0.82	3.04	0.34
Publish data in open repositories - Publish results in non-academic media	0.91	0.46	1.79	1.00
Publish data in open repositories - Publish results in open-access journals	0.94	0.48	1.86	1.00
Publish instruments - Publish results in non-academic media	0.57	0.29	1.11	0.16
Publish instruments - Publish results in open-access journals	0.59	0.31	1.15	0.22
Publish results in non-academic media - Publish results in open-access journals	1.04	0.52	2.07	1.00