European Journal of Orthopaedic Surgery & Traumatology (2025) 35:250
https://doi.org/10.1007/s00590-025-04386-2

RESEARCH

Exploring research knowledge and interests among Argentinian orthopedic trauma surgeons: a survey-based study to implement strategic tools for curricular development GAIA (Group for Support of Argentine Research)

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Received: 12 December 2024 / Accepted: 1 June 2025

Abstract

Introduction Scientific research is the key to advancing a country's healthcare system, as it yields critical knowledge that can address specific clinical challenges and guide the development of effective healthcare strategies. In this context, orthopedic surgeons in Argentina established the Argentine Research Support Group (GAIA—Grupo de Apoyo a la Investigación de Argentina) to promote and support local research on musculoskeletal trauma. This study aimed to assess the level of training, interest, and barriers related to research among Argentine trauma surgeons.

Methods A cross-sectional descriptive study was conducted using an anonymous and voluntary electronic survey (Microsoft Forms®) between August and November 2024. The survey consisted of six closed-ended questions, with simple (questions 1–4) and multiple (questions 5 and 6) response options. The first four questions investigated demographic characteristics and the number of publications, while the last two assessed training and interest in receiving specific research training. The Argentine Research Support Group (AO Trauma Latin America) designed the survey.

Results A total of 467 (14.1%) responses were collected. Of these, 162 (35%) surgeons reported having published at least once, and 14 (3%) had received training on all survey topics. Regarding the reasons for not publishing (the remaining 305—65%), the most common responses were the lack of a research support group (29%) and insufficient protected time (28%). Concerning interest in receiving specific training, the most frequent responses were related to study design (56%), manuscript writing (58%), and external support from a research group (59%).

Conclusion This study highlights the low frequency of publications and the strong interest in participating in research studies among Argentine trauma surgeons. The lack of training and knowledge in essential research aspects and the absence of support groups were identified as modifiable barriers. Future educational and collaborative national and regional action plans must address this issue.

Keywords Scientific research · Barriers · Research methodology · Scientific writing · Research education

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Published online: 17 June 2025

Introduction

Scientific research is the key to advancing a country's healthcare system, as it yields critical knowledge that can address specific clinical challenges and guide the development of effective healthcare strategies [1–4]. In the field of musculoskeletal trauma, research serves a particularly crucial role due to the disproportionate rise in trauma cases, especially in low- and middle-income countries [5, 6]. While valuable insights have been gained from research conducted in high-income countries, applying these findings to lower-income settings can be challenging, as it may overlook important economic, cultural, and demographic differences that shape people's lived experiences [7–9].

Latin America currently contributes less than 2% of the global scientific publications in high-impact journals [9]. Recognizing that publication represents the final step in the research process, several barriers must be overcome, including a lack of formal research training, limited resources, and insufficient protected time for research [3, 10–12]. These challenges can make the path to publication overwhelming and isolating when pursued individually. One of the most effective ways to overcome these obstacles is through collaborative research, which involves pooling efforts and resources across individuals, groups, institutions, and organizations to produce high-quality scientific work [11, 13, 14].

In this context, orthopedic surgeons in Argentina established the Argentine Research Support Group (GAIA—Grupo de Apoyo a la Investigación de Argentina) to promote and support local research on musculoskeletal trauma. This initiative was inspired by the regional research support network (Grupo de Apoyo a la Investigación—GAI), created a few years ago by the AO Trauma Latin America (AOTLAT) board [6].

This study aimed to conduct a survey assessing the level of research training and interest among orthopedic surgeons in Argentina and to identify the most common challenges and gaps in research education.

Methods

A cross-sectional descriptive study was designed using an anonymous, voluntary online survey created with Microsoft Forms® (free software). The survey was distributed by email between August and September 2024, using the Argentine Association of Orthopedic Trauma (AATO) database and the Argentine Association of Orthopedics and Traumatology (AAOT). The survey was designed to be completed by trainees (Residents) and more experienced professionals after residency. No identifying information was requested from respondents, and the data were encrypted in an Excel spreadsheet (Microsoft) generated by the survey software.

The survey development team (GAIA) comprised six experienced surgeons, each with multiple peer-reviewed publications and international presentations in their respective specialties. This diverse and skilled team collaboratively ensured the content validity and methodological rigor of the survey instrument.

To ensure that only one survey was completed per surgeon, unique survey links were distributed, and responses were monitored for duplicate entries based on identifying information such as email addresses or institutional affiliations. Members of the survey development team conducted internal testing of the survey to ensure clarity and consistency. External testing, including beta testing, was carried out by members of the AAOT who were not involved in the survey design, allowing for objective feedback and validation of the survey content.

The survey consisted of six closed-ended questions (Fig. 1). The first four questions had single-choice responses, the fifth offered multiple-choice options, and the sixth used a Likert scale. The first four questions gathered information about gender, professional experience, prior research involvement, and interest in engaging in research activities.

When the participant answered "No publications" to question four, question five asked them to identify potential reasons for not publishing. Seven possible reasons were provided, and respondents rated their relevance on a Likert scale from 1 (less relevant) to 5 (more relevant). When the responder answered Yes (between 1 and 3 or more than 4 publications) to question four, question five asked them for the basic research training received.

All participants completed the survey with question six, which explored areas where they would like further training. Respondents rated their interest in five specific topics using the same Likert scale.

Statistical analysis

We transferred the collected data into an Excel spreadsheet via the survey software and coded it for analysis. We performed descriptive statistics for all survey questions using cumulative and total proportion tests to determine the values for each question, subdivided by group. We analyzed the statistical using Jamovi software (The Jamovi Project, 2024, version 2.5).

Results

The survey was sent to 3302 Argentinian orthopedic surgeons. A total of 467 (14.1%) responses were received. Table 1 summarizes the results regarding the gender,

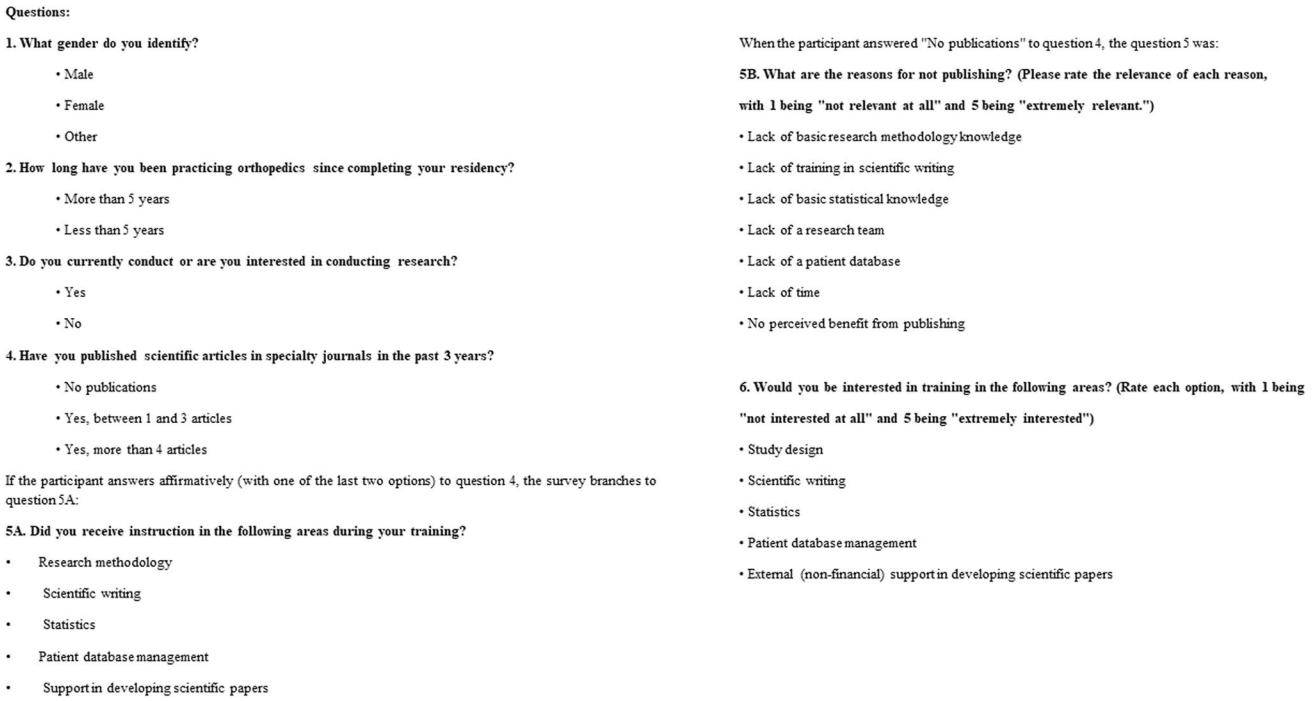

Fig. 1 Survey

Table 1 Demographics of the respondents

		n (%)
Gender	Female	74 (15.8)
	Male	392 (83.9)
	Other	1 (0.2)
Research interest	Yes	395 (84.6)
	No	72 (15.4)
Experience	< 5 years from residence finish	211 (45.2)
	> 5 years from residence finish	256 (54.8)
Publications number	None	305 (65.3)
	Between 1 and 3	112 (24.0)
	> 4	50 (10.7)

experience, interest, and number of publications reported by the respondents.

Among the subgroup who reported having published at least one article ($N = 162$, 34.7%), 40 (25%) stated that they had received training in research methodology, 24 (15%) in scientific writing, 13 (8%) in database management, and 2 (1.2%) in statistics. Regarding multiple responses to this question, 5 (3%) indicated receiving training in all four areas, 11 (7%) reported training in all areas except statistics, and 4 (2.5%) received combined training in research methodology and statistics. The remaining combinations each accounted for less than 1% of responses.

In the subgroup that reported not having published any article ($N = 305$, 65.3%), the reasons for this were assessed using the Likert 5-point scale (1 = least relevant and 5 = most relevant). The detailed responses are presented in Fig. 2.

Finally, regarding the responses to question 6 (which was common for all participants), none of the five areas presented less than 50% of responses indicating "maximum interest" (a Likert value of 5). The detailed data for each item, including percentages based on the Likert 5-point scale, are found in Fig. 3.

Discussion

This study analyzed the responses from 467 orthopedic surgeons in Argentina to describe their interest in scientific research. It also sought to assess the level of training they received in research, the barriers they encountered in conducting research, and their potential needs and interests regarding research education. A key finding from this survey is that most respondents demonstrated a strong research interest regardless of age. However, despite over 84% of surgeons expressing interest in research, 65% have not yet published any work, meaning that only one-third of respondents have successfully published at least one article.

The low frequency of publications in Latin America developing countries like Argentina has been reported previously and reflects the very low importance of research

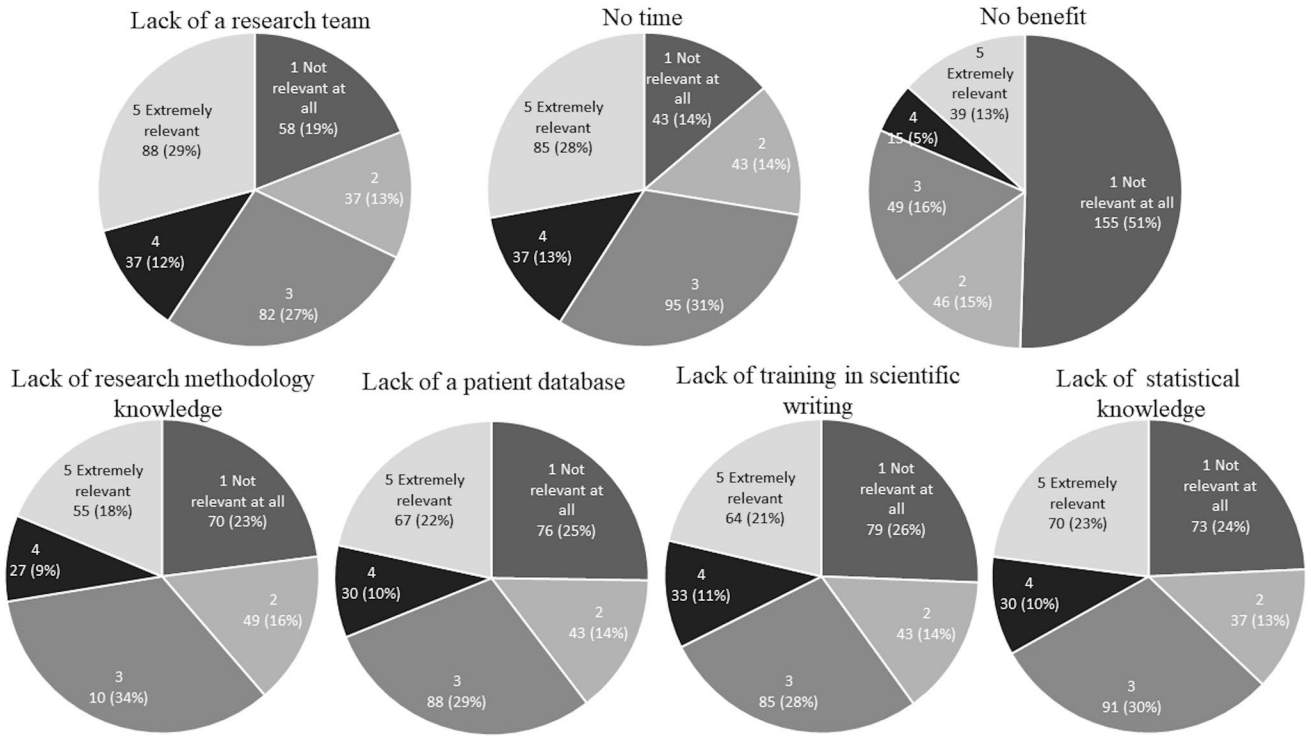

Fig. 2 Detail of the answers to question 5B, where different aspects of the research are related to the possible reasons for not making scientific publications. Linkert scale (1 = not relevant at all and 5 = extremely relevant). **a** Lack of basic research methodology knowledge; **b** lack of time; **c** no perceived benefit from publishing; **d** lack of basic statistical knowledge; **e** lack of a patient database; **f** lack of training in scientific writing; and **g** lack of basic statistical knowledge

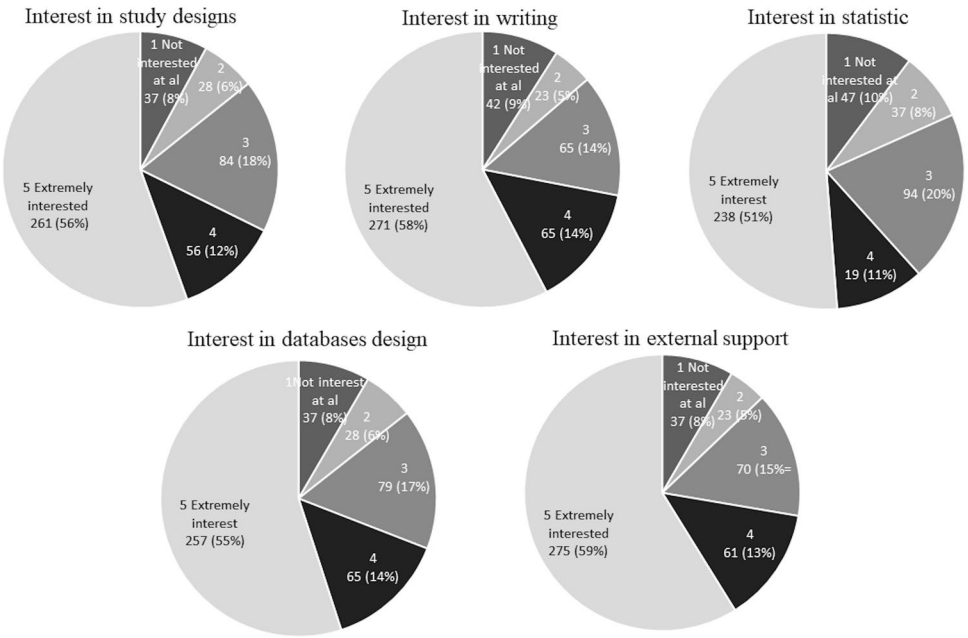

Fig. 3 Detail responses to question 6 regarding the respondents' interest in receiving education in five aspects related to education and external support for studies. Linkert scale (1 = not interest at all and 5 = extremely interested). **a** study design; **b** scientific writing; **c** statistics; **d** patient database management; and **e** external (non-financial) support in developing scientific papers

from local governments, where most countries only invest up to 1% of their gross domestic product (GDP) resources in health research [6, 9]. It creates several gaps, problems, and obstacles to knowledge that remain active and must be recognized and addressed. In this context, it is concerning that only 3% of our respondents have received formal training in key research areas, such as research methodology, scientific writing, statistics, and database management.

In 2011, Chomsky-Higgins et al. [3] reported the results of a survey conducted with participants from 13 different countries in Latin America, held before a meeting of the Forum of the Americas of the Osteosynthesis and Trauma Care Foundation. These authors showed that although most participants expressed research interest, only one-third were actively involved in a research project [3]. They identified several barriers, mainly related to structural, logistical, and intrapersonal factors that potentially hinder the development of continuous regional research [3, 11–13]. This aligns with our findings that 65% of respondents identified the absence of a research support group and the lack of dedicated or "protected" time for research as the main barriers to publishing scientific studies.

In this context, recognizing the barriers to scientific work and promoting research education for all orthopedic surgeons in Argentina is essential. Encouragingly, these challenges are gradually being addressed through the efforts of a dedicated group of orthopedic surgeons, whose motivation has enabled the development of collaborative, multicenter research initiatives through both the GAI and GAIA [6]. The structured promotion of scientifically active clinicians and physician–scientists and the support for establishing interdisciplinary team structures have been shown to be potential tools to facilitate knowledge transfer in medical education [2]. Only with the accessibility to information and the growing support from organizations promoting collaborative research between high- and low-resource countries, such as AO and ACTUAR, can these barriers be overcome.

Our findings demonstrated that it is time to establish strategic measures to increase academic productivity and personal development among orthopedic surgeons in Argentina. Moreover, the implementation of career guidance, mentorship, and leadership programs is urgently needed, as evidence shows that having a mentor is strongly linked to increased time dedicated to research. Feldman et al. [15] found that having a mentor was associated with greater satisfaction with time allocation at work and higher academic self-efficacy scores than those without a mentor among 464 junior faculty mentees at the University of California in San Francisco (UCSF). We understand these actions as cornerstones to either reduce or fill the gaps and problems related to the lack of institutional incentives, financial compensation, academic recognition, and heavy clinical workloads.

This study highlights a strong and widespread desire among orthopedic surgeons to deepen their engagement with research. Nearly all respondents expressed interest in receiving research-related training, with particular enthusiasm for mentorship or collaboration with research groups (72%), support for scientific writing (71%), database management (69%), study design (67.7%), and statistics (61.5%). These findings underscore a meaningful opportunity to nurture research capacity in Argentina by establishing dedicated support networks, strengthening ties with local and international research communities, and promoting mentorship and leadership development. Investing in these areas can empower surgeons to contribute more fully to scientific advancement, both locally and globally.

This study's limitation includes the inherent limitations of survey-based research with limited participants. While the number of respondents seems adequate, it is difficult to assert that these findings fully represent the state of orthopedic research across the field. Additionally, the survey did not include open-ended questions where respondents could provide more detailed insights, meaning the study only reflects the issues specifically investigated. Finally, we could not test the real engagement between respondents to be at least initially involved in some research activity, such as a seminar or a symposium held by the GAIA.

However, we recognize that our study has several strengths. To the best of our knowledge, this is the first study in Argentina trying to identify the gaps and the level of interest in scientific research among orthopedic surgeons. Moreover, this study creates the possibility of developing strategies for ensuring best practices in medical education, which is beneficial for defining competencies and assessing development tools [18, 19]. Indeed, this will be the next step in developing an educational research curriculum [19, 20].

Conclusion

This study demonstrates the low number of publications currently produced by orthopedic surgeons in Argentina. However, it also highlights respondents' strong interest in participating in research studies. Key barriers identified include the lack of training and knowledge in basic research principles and the absence of research support groups, which are challenges that the GAIA can potentially address in the short- and long-term. We emphasize the need for future educational action plans to improve research-related education and stimulate connections between interested physicians and local or international research support groups.

Author contribution All authors contributed to the study´s conception and design. GG, LLL, and SP performed material preparation, data collection, and analysis. GG wrote the first draft of the manuscript. All authors read and approved the final manuscript.

Funding No funds, grants, or other support was received.

Data availability No datasets were generated or analysed during the current study.

Declarations

Conflict of interest The authors declare no competing interests.

Ethical approval All procedures followed were in accordance with the ethical standards of the Sirio Libanes Hospital committee on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008.

Informed consent Not required.

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