Current Status of Scientific Research on Musculoskeletal Trauma in Argentina: A Survey-Based Study

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ABSTRACT

Introduction: The aim of this study was to assess the level of training, interest, and barriers related to research among orthopedic trauma surgeons in Argentina. **Materials and Methods:** A descriptive cross-sectional study was conducted using an anonymous, voluntary electronic survey between August and November 2024. The survey consisted of six closed-ended questions: the first four (single-choice) collected demographic information and data regarding previous publications, while the last two (multiple-choice) addressed training and interest in receiving specific research education. The survey was designed by the *Grupo de Apoyo a la Investigación Argentina* [Argentine Research Support Group]. **Results:** A total of 467 responses were obtained. 35% of respondents reported having at least one publication, while only 3% indicated having received training in all assessed items. Among those who had never published (the remaining 65%), the most frequently cited reasons were the lack of a research support group and the absence of protected research time. Regarding interest in receiving specific training, the most common responses were related to study design, scientific writing, and receiving external support from a research group. **Conclusions:** This study revealed a low publication rate but a strong interest in participating in research among Argentine orthopedic trauma surgeons. The lack of training and knowledge in basic research principles, along with the absence of support groups, emerged as potentially modifiable barriers. National and regional educational and collaborative action plans are needed to change this situation.

Keywords: Research; scientific work; writing; research study design; barriers.
Level of Evidence: IV

Estado actual de la investigación científica sobre el trauma musculoesquelético en la Argentina. Estudio a partir de una encuesta

Resumen

Introducción: El objetivo de este estudio fue investigar el nivel de formación, el interés y las barreras respecto a la investigación en los traumatólogos de la Argentina. **Materiales y Métodos:** Se realizó un estudio descriptivo transversal utilizando una encuesta electrónica anónima y voluntaria, entre agosto y noviembre de 2024. Constaba de 6 preguntas cerradas de respuesta simple (preguntas 1-4) y múltiple (preguntas 5 y 6). Las primeras 4 reunían datos sobre las características demográficas y la cantidad de publicaciones, y las segundas 2, la formación y el interés en recibir formación específica en investigación. La encuesta fue diseñada por el Grupo de Apoyo a la Investigación Argentina. **Resultados:** Se obtuvieron 467 respuestas. El 35% respondió contar con alguna publicación, y el 3%, haber recibido formación en todos los ítems. Respecto a las razones de no haber publicado (65% restante), las respuestas más frecuentes fueron: falta de un grupo de apoyo en investigación y de tiempo protegido. En cuanto al interés en recibir formación específica, las respuestas más frecuentes correspondieron al diseño y la redacción de trabajos, y

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al apoyo externo de un grupo de investigación. **Conclusiones:** Este estudio reveló la baja frecuencia de publicaciones y el gran interés en participar en estudios de investigación entre los traumatólogos de la Argentina. La falta de formación y conocimientos en aspectos básicos de la investigación y la falta de grupos de apoyo se identificaron como barreras potencialmente modificables. Se necesitan planes de acción educativos, colaborativos nacionales y regionales para cambiar esta realidad.
Palabras clave: Investigación; trabajo científico; redacción; diseño de trabajos de investigación; barreras.
Nivel de Evidencia: IV

INTRODUCTION

Scientific research is a fundamental component of the development of a country's health system. It is essential for generating authentic knowledge that enables the resolution of specific clinical problems and the design of health strategies.[1-3] In the field of musculoskeletal trauma, given its disproportionately increasing incidence, especially in low- and middle-income countries, research acquires a decisive role.[1] However, the vast majority of research studies are produced in high-income countries, and their findings are subsequently extrapolated to middle- and low-income regions despite clear economic, cultural, and demographic differences.[4-6] Currently, and focusing exclusively on our region, Latin America contributes only 1% to 2% of scientific publications in high-impact journals.[6]

In order to complete the publication process, the final step of any research initiative, it is necessary to overcome numerous barriers, including the lack of formal research training, insufficient resources, and the absence of protected time dedicated to research, among others.[2,7] As a result, the pathway toward publication can be overwhelming and isolating when viewed from the outset. One of the most effective tools for overcoming these difficulties is collaborative research.[8-10] This approach involves pooling efforts and capabilities among individuals, groups, institutions, and organizations whose strengths complement one another in the shared goal of producing high-quality scientific work.

For these reasons, in Argentina we formed a group of orthopedic trauma surgeons (*Grupo de Apoyo a la Investigación Argentina* [Argentine Research Support Group]) with the purpose of promoting and strengthening the development of local research studies in musculoskeletal trauma. The initiative was inspired by the regional research group (*Grupo de Apoyo a la Investigación*, GAI) created several years ago by the Board of AO Trauma Latin America (AOTLA).[11,12]

As our group's initial objective, we set out to: 1) conduct a survey to assess the level of research training and general interest in research among orthopedic trauma surgeons in Argentina; 2) identify the most common shortcomings and difficulties in research training; and 3) design future strategies to foster and support the training of physicians interested in research.

MATERIALS AND METHODS

A descriptive cross-sectional study was designed using an anonymous, voluntary online survey created with Microsoft Forms®. The survey was distributed by email between August and November 2024, using the database of the Argentine Association of Traumatology and Orthopedics (AAOT). It was also promoted at this year's congress of the Argentine Association of Orthopedic Trauma (*Asociación Argentina de Trauma Ortopédico*, AATO) and through the social media accounts of both associations (AAOT, AATO). It was announced across all channels as an anonymous and voluntary survey, with the aim of gaining an overview of the local situation of research in orthopedics and traumatology.

The survey was designed to be completed by both trainees (residents) and more experienced specialists who had already finished their residency. No identifying information was requested, and the data collected were encrypted in an Excel® file generated by the survey platform.

The questionnaire consisted of six closed-ended questions: the first four required a single-choice response, question five used multiple-choice format, and question six used a Likert scale.

The first four questions collected information regarding respondents' gender, level of experience, prior research activity, and interest in undertaking research:

Questions:

1. Which gender do you identify with?
• Male
• Female
• Other

2. You are an orthopedist with:
• more than 5 years since completing your residency
• less than 5 years since completing your residency

3. Do you currently conduct—or would you be interested in conducting—research?
Yes
No

4. Have you published scientific articles in specialty journals in the last 3 years?
• Yes, more than 4 papers
• Yes, between 1 and 3 papers
• No, none

If the participant selected either of the first two affirmative options in question 4, the survey branched to question 5, which explored the basic research training received during their education:

5. During your training, did you receive instruction in:
• Research methodology
• Scientific writing
• Statistics
• Development of patient databases

If the participant selected the negative option ("No, none") in question 4, question 5 instead explored potential reasons for this, offering seven possible explanations. Each was rated using a Likert scale from 1 to 5, where 1 = minimally relevant and 5 = highly relevant:

- Why? (Rate each reason according to its importance)
• I lack basic knowledge of research methodology.
• I did not receive training in scientific writing.
• I did not receive basic training in statistics.
• I do not have a team to conduct research with.
• I do not have access to a patient database.
• I do not have time.
• I do not perceive any benefit in conducting research.

All participants concluded the survey with question 6, which assessed the areas in which they would be interested in receiving additional training, again using a Likert scale from 1 (least interested) to 5 (most interested):

6. Would you be interested in receiving training in:
• Research study designs
• Scientific writing
• Statistics
• Development of patient databases
• External (non-financial) support in the development of scientific projects

Statistical Analysis

The data obtained were transferred to an Excel® spreadsheet by the platform used and were subsequently coded for analysis. Descriptive statistics were performed for all questions, applying a total and cumulative proportion test to obtain the values corresponding to each question and, in turn, to allow subdivision by group. The analysis was carried out using the Jamovi software (the jamovi project, 2024; version 2.5).

RESULTS

A total of 467 responses were received. The proportions of gender, experience, interest, and number of publications reported by respondents are shown in Table 1.

Table 1. Gender, research interest, experience, and number of publications among respondents.

		Frequency	Proportion
Gender	Female	74	15.80
	Male	392	83.90%
	Other	1	0.20
Interest in research	Yes	72	15.40
	No	395	84.60%
Experience	Orthopedist with <5 years since completion of residency	211	45.20
	Orthopedist with >5 years since completion of residency	256	54.80
Number of publications	>4	50	10.70
	Between 1 and 3	305	65.30
	None	112	24

Gender	Publications	Frequency	% of total	Cumulative %
Female	Yes, more than 4	6	1.30	1.30
	None	48	10.30	11.60
	Yes, between 1 and 3	20	4.30	15.80
Male	Yes, more than 4	44	9.4	25.30
	No, none	256	54.80	80.10
	Yes, between 1 and 3	92	19.70	99.80
Other	Yes, more than 4	0	0	99.80
	No, none	1	0.20	100
	Yes, between 1 and 3	0	0	100

In the subgroup that reported having published (n = 162), 25% indicated having received training in research methodology; 15% in scientific writing; 8% in patient database development; and 1.9% in statistics. Regarding multiple selections within this question, 3% reported having received training in all four selectable items; 7% in all items except statistics; and 2.5% reported combined training in research methodology and statistics. All other combinations had a frequency below 1%.

Within the subgroup that reported not having published (n = 305), the reasons for this were evaluated using a Likert scale (1 = least relevant, 5 = most relevant). Details are presented in Figures 1-7.

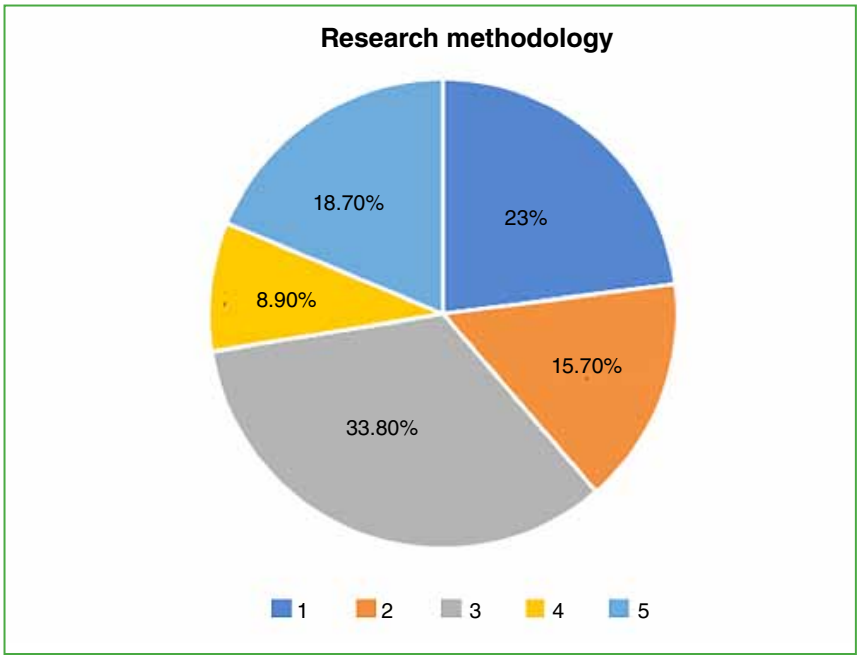

Figure 1. I do not have basic knowledge of research methodology.

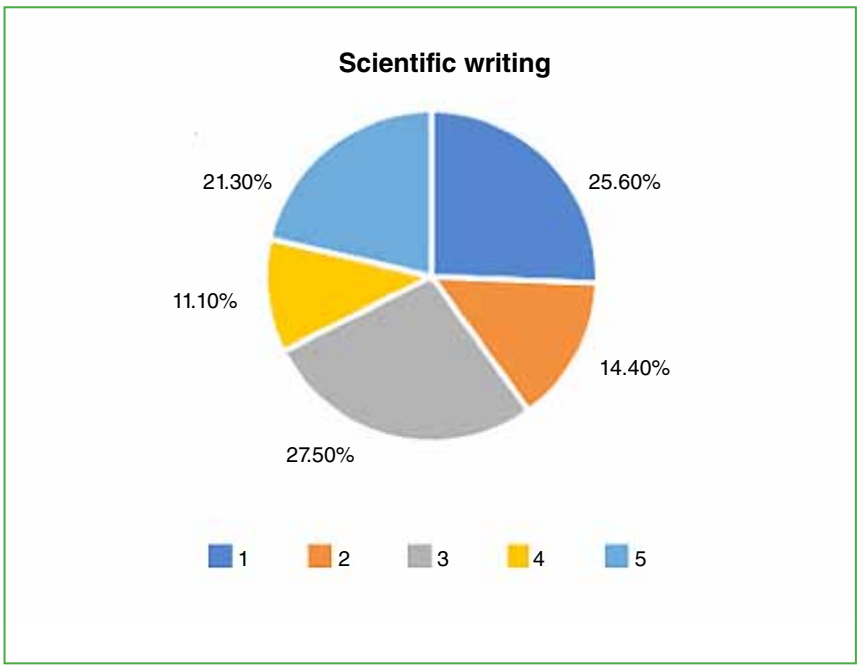

Figure 2. I did not receive training in scientific writing.

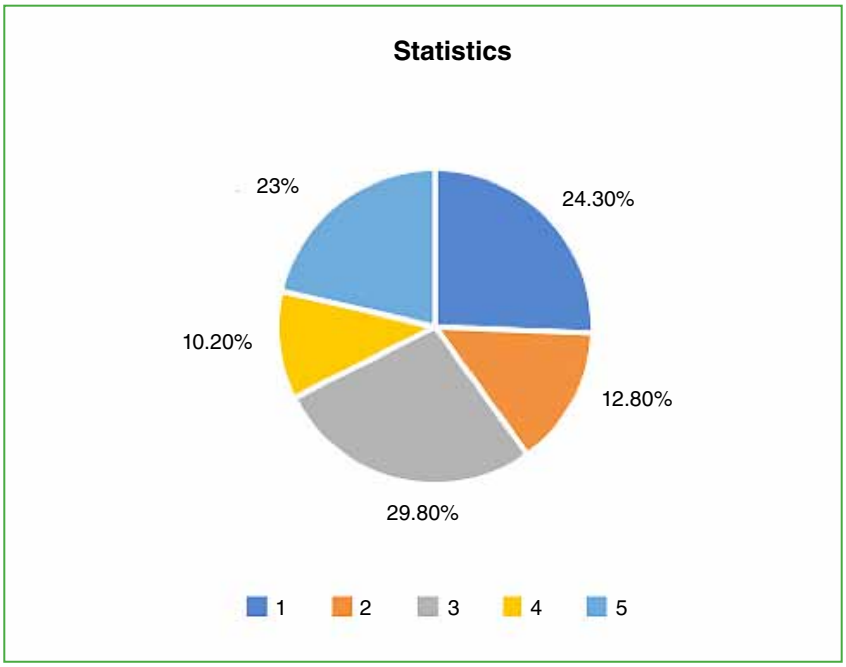

Figure 3. I did not receive basic training in statistics.

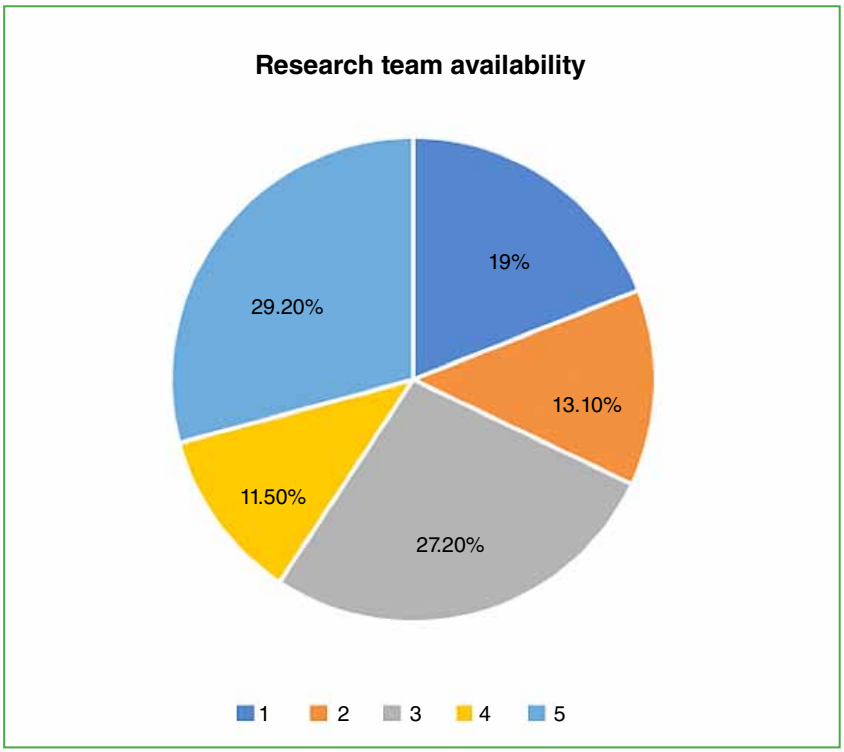

Figure 4. I do not have a team of people to conduct research with.

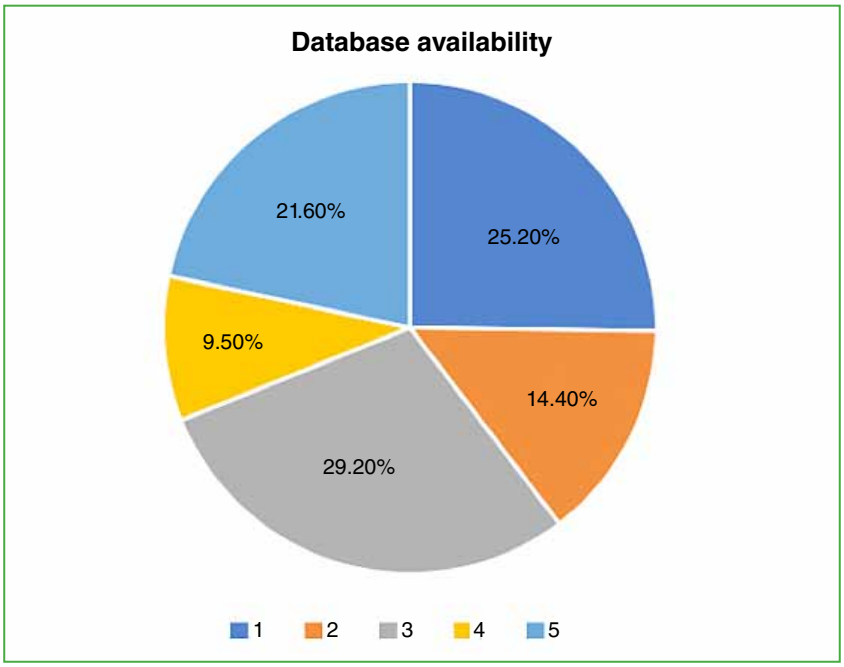

Figure 5. I do not have access to a patient database.

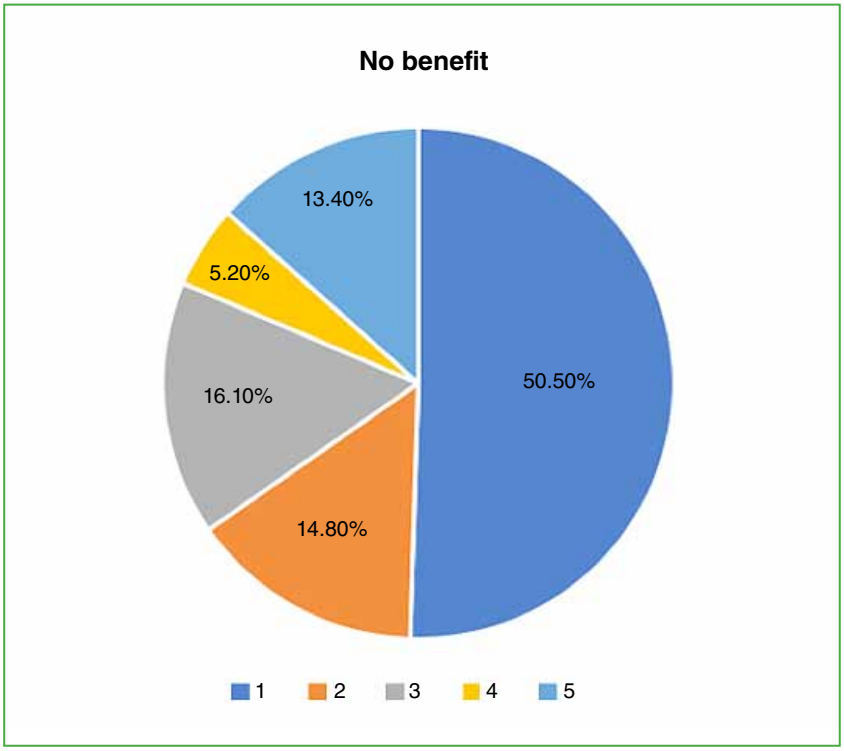

Figure 6. I do not perceive a benefit in conducting research.

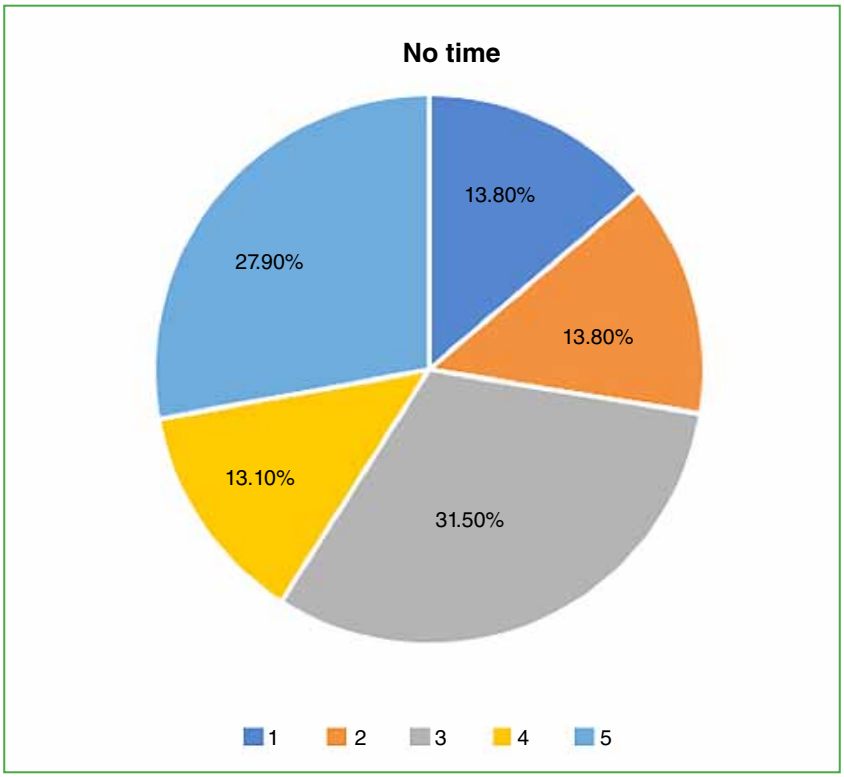

Figure 7. I do not have time.

Finally, regarding the responses to question 6 (common to all participants), none of the five items received fewer than 50% of maximum-interest responses (value 5 on the Likert scale). Tables 2-6 detail the responses to each item of question 6 according to the Likert scale.

Table 2. Interest in receiving training in study design (1 = least interested; 5 = most interested)

Interest in design	Frequency	%
1	37	7.90
2	30	6.40
3	84	18.00
4	57	12.20
5	259	55.50

Table 3. Interest in receiving training in scientific writing (1 = least interested; 5 = most interested)

Interest in writing	Frequency	%
1	42	9
2	22	4.70
3	67	14.30
4	67	14.30
5	269	57.60

Table 4. Interest in receiving training in statistics (1 = least interested; 5 = most interested)

Interest in statistics	Frequency	%
1	48	10.30
2	38	8.10
3	94	20.10
4	49	10.50
5	238	51.50

Table 5. Interest in receiving training in patient database development (1 = least interested; 5 = most interested)

Interest in database development	Frequency	%
1	39	8.40
2	28	6
3	77	16.50
4	66	14.10
5	257	55

Table 6. Interest in receiving external (non-financial) support for research (1 = least interested; 5 = most interested)

Interest in support	Frequency	%
1	39	8.40
2	21	4.50
3	69	14.80
4	63	13.50
5	275	58.90

DISCUSSION

This study sought to describe interest in scientific research by analyzing responses from 467 orthopedic surgeons in Argentina, as well as to characterize the level of training they have received in this area, the barriers they face in conducting research (or in choosing not to), and their perceived needs and interests related to research education.

The first noteworthy finding of this survey is that, regardless of age, most respondents expressed strong interest in research. However, despite this interest reported by 83% of surgeons, 65% have not been able to publish; in other words, only one-third have published at least once. The low publication rate in developing countries such as ours has already been described. In 2011, Higgins et al. reported the results of a survey of physicians from 13 Latin American countries and found that, although most participants were interested in research, only one-third were involved in a project at that time.[2] This demonstrates that, although interest in scientific research is high in Latin America, significant "barriers" to its development persist.[2,7]

In 2017, the ACTUAR group (*Asociación de Cirujanos Traumatológicos de las Américas* [Association of Trauma Surgeons of the Americas]), composed of surgeons from 13 countries in the region, analyzed the barriers to research in Latin America. Their work outlines a list of potential challenges that researchers may encounter and proposes possible solutions to overcome them.[2] In another study, the same group identified the main barriers to the development of a clinical research study in Mexico, which they classified into three categories: structural, logistical, and intrapersonal.

Although economic and structural conditions are indeed fundamental, today, with widespread access to information and increasing opportunities for collaborative research between high- and low-resource countries, many of these barriers can be mitigated. Therefore, we believe that the barriers related to the "development" of a physician-researcher (those previously described as intrapersonal) may be the most decisive. In this regard, the strong interest expressed by respondents in participating in research is encouraging. Conversely, it is concerning that only 3% reported having received any formal training in what we consider essential skills for research: methodology, scientific writing, basic statistics, and database development.

Writing a research article requires substantial personal effort, particularly in Latin America, where limited institutional incentives and the lack of financial, professional, or academic rewards coexist with a heavy daily clinical workload. When we explored the potential reasons why 65% of respondents had never published, the most common factors were the absence of a research support group and the lack of dedicated or "protected" time for research.

When we asked respondents about their interest in receiving research-related training, we found high levels of interest across most domains. The items that received the highest interest scores were: external (non-financial) support from mentors or research groups (72%), assistance with scientific writing (71%), database development (69%), study design (67.7%), and, lastly, statistics (61.5%). In our view, this highlights the need to create research support groups and to foster greater interconnection between motivated surgeons and existing research networks.

This study has limitations inherent to survey-based research with a restricted number of participants. Although the number of respondents is seemingly adequate, it is difficult to assert that it represents the full landscape of orthopedic research in the country. Furthermore, the survey did not include open-ended questions or free-text fields that would have allowed respondents to elaborate on specific issues, and thus reflects only the aspects directly assessed.

CONCLUSIONS

This study highlights the low number of publications produced by orthopedic surgeons in Argentina today. At the same time, it reveals the strong interest expressed by respondents in participating in research studies. A lack of formal training, insufficient knowledge of basic research principles, and the absence of support groups were identified as potentially modifiable barriers in both the short and long term.

We emphasize the need to design future educational initiatives aimed at strengthening research-related training while simultaneously fostering connections between interested physicians and local or international research support networks.

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