

Research skills and associated factors in students of a peruvian public university

Habilidades investigativas y factores asociados en estudiantes de
una universidad pública peruana

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ABSTRACT

Background: Research in higher education plays an important role as it serves as the basis for generating new knowledge and proposing solutions to existing societal problems. Therefore, it is necessary to understand how developed university students' research skills are, as well as the factors that may influence them.

Objective: To determine the factors associated with research skills in students at a Peruvian public university.

Methods: A descriptive study with a quantitative approach was conducted at the Universidad Nacional Mayor de San Marcos during September 2022. Theoretical methods included analysis-synthesis and induction-deduction; empirical methods included the survey technique. Two questionnaires administered virtually served as the data collection instruments.

Results: Among Obstetrics students, an adequate level of research skills predominated. The dimensions with the highest percentages were cooperative and technological skills. Factors significantly associated with research skills included: participation in research projects, year of study, publication of articles in Scopus, and organization of academic events ($p < 0.05$).

Conclusions: Research skills are mainly associated with participation in research projects and institutional factors, highlighting the need to strengthen research training within university education.

MeSH: Obstetrics; research design; learning; students; education, medical.

RESUMEN

Fundamento: la investigación en la educación superior cumple un papel importante ya que sirve de base para generar nuevos conocimientos, así como para plantear soluciones a los problemas que existen en la sociedad. Por ello, es necesario conocer cuán desarrolladas están las habilidades investigativas de los estudiantes universitarios así como los factores que pueden afectarlas.

Objetivo: determinar los factores que se asocian a las habilidades investigativas en estudiantes de una universidad pública peruana.

Métodos: se realizó una investigación descriptiva con enfoque cuantitativo, en la Universidad Nacional Mayor de San Marcos durante el mes de septiembre de 2022. Se utilizaron como métodos teóricos: el análisis-síntesis y la inducción-deducción; y empíricos: la técnica de la encuesta. Los instrumentos fueron dos cuestionarios administrados por vía virtual.

Resultados: en las habilidades investigativas de los estudiantes de Obstetricia predominó el nivel adecuado. Las dimensiones que presentaron mayor porcentaje fueron la cooperativa y la tecnológica. Los factores que presentaron asociación significativa con las habilidades

investigativas fueron: participar en proyectos de investigación, el año de estudio, publicar artículos en *Scopus* y organizar eventos académicos ($p < 0,05$).

Conclusiones: las habilidades investigativas se asocian principalmente con la participación en proyectos de investigación y con factores institucionales lo que evidencia la necesidad de fortalecer la investigación formativa en la formación universitaria.

DesC: Obstetricia; proyectos de investigación; aprendizaje; estudiantes; educación médica.

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INTRODUCTION

The purpose of research in higher education fundamentally focuses on solving problems within the student's environment to contribute to societal development.⁽¹⁾ However, in some universities, its role has been reduced to merely completing theses for obtaining a professional degree.

To fulfill this purpose, it is necessary to strengthen students' research skills, as well as their knowledge of the scientific practice required for academic work, as these enable university students to develop critical thinking, the ability to obtain scientific information from reliable sources, and self-directed learning.⁽²⁾

The term "research skills" refers to a set of diverse abilities developed before an individual engages in research-related processes. These skills are generally not used for research purposes, but educators can identify and develop them to enhance students' capacity to conduct research within quality standards.⁽³⁾

Research skills can be grouped into seven domains: exploratory, technological, methodological, analytical and interpretative, written communication, oral communication, and cooperative.⁽⁴⁾ However, there is no uniformity in criteria for classifying and categorizing them across universities, which affects the planning of teaching-learning processes and the development of appropriate didactic strategies in formative research courses.⁽⁵⁾

Regarding potential factors associated with the development of research skills, experiences such as belonging to a student scientific society or participating in/organizing scientific events have been reported to help students improve their research competencies and complement teachings that did not meet their expectations or learning outcomes in the curriculum. However, there is controversy regarding whether these findings are similar across all health science areas or academic programs.⁽⁶⁾

Concerning students in medical fields, a high percentage self-perceive deficient research skills, especially in aspects such as applying statistical methods, correctly choosing data collection techniques and instruments, adequately using bibliographic managers, among others—to the point of significantly reducing their interest in scientific research, as reported by Lorenzo et al.⁽⁷⁾ in a study conducted in Cuba.

In Peru, universities are required to meet research standards focused on scientific production, with indicators such as the number of publications in high-impact indexed journals, which has increased considerably in recent years despite deficiencies in the plans developed to achieve this objective.⁽⁸⁾ The limited number of research policies implemented by licensed Peruvian universities necessitates, among other measures, the optimization of formative research to develop students' research skills and collaborative research activities.⁽⁹⁾

Regarding the School of Obstetrics at the Universidad Nacional Mayor de San Marcos, the research area has been restructured in recent years to improve its quality standards, reflected in an increase in scientific article publications based on defended theses. However, these figures still fall short of the set targets.⁽¹⁰⁾

Based on the aforementioned reality and concepts, the objective of this research was formulated to determine the factors associated with research skills in students at a Peruvian public university. This information will serve as a reference for developing improvement strategies in the field of formative research.

METHODS

An observational, descriptive-correlational, cross-sectional study was conducted to analyze research skills and their relationship with personal and institutional factors in Obstetrics students at the university. The study was carried out at the Professional School of Obstetrics of the Universidad Nacional Mayor de San Marcos (UNMSM) during the 2025-II academic period.

The population consisted of 310 third-, fourth-, and fifth-year students of the Obstetrics program at UNMSM. The study included students who met the following inclusion criteria: a) being correctly enrolled in the 2025-II academic cycle, and b) having completed at least one of the research courses included in the curriculum. Students who did not agree to participate in the study by signing the informed consent form were excluded.

The sample was census-based and consisted of 290 students, after excluding 20 who did not provide their consent to participate.

Theoretical methods:

Analysis-synthesis: Used to break down theoretical information related to research skills and associated factors, as well as to integrate relevant findings from the study.

Induction-deduction: Used to draw inferences from the results obtained and contrast them with theoretical foundations and scientific background.

Empirical methods: A survey was applied using structured questionnaires, administered virtually via the Google Forms platform during September 2022.

The following instruments were used:

The research skills scale developed by Chávez et al.,⁽⁴⁾ consisting of 36 items with five alternatives, with scores ranging from 1 (never) to 5 (always). This instrument comprises seven dimensions:

- Exploratory Domain (8 items)
- Technological Domain (4 items)
- Methodological Domain (3 items)
- Analytical and Interpretative Domain (4 items)
- Written Communication Domain (6 items)
- Oral Communication Domain (7 items)
- Cooperative Domain (4 items)

It has high total reliability (Omega = 0.859) according to its authors.

Overall, research skills were categorized as inadequate (up to 125 points) and adequate (126 to 180 points).

Each of the domains of the research skills scale was also categorized as inadequate or adequate based on the score obtained, as listed below:

Exploratory Domain: Inadequate (score < 28); Adequate (28 to 40)

- Technological Domain: Inadequate (score < 14); Adequate (14 to 20)
- Methodological Domain: Inadequate (score < 11); Adequate (11 to 15)
- Analytical and Interpretative Domain: Inadequate (score < 14); Adequate (14 to 20)
- Written Communication Domain: Inadequate (score < 21); Adequate (21 to 30)

- Oral Communication Domain: Inadequate (score < 24); Adequate (24 to 35)
- Cooperative Domain: Inadequate (score < 14); Adequate (14 to 20)

The Questionnaire of Associated Factors measures personal and institutional factors and consists of 12 dichotomous items, with the exception of the year of study, which has three categories.

The Academic Satisfaction Scale (ESA) in the version adapted by Medrano et al.⁽¹¹⁾ consists of eight items with four alternatives, with scores ranging from 0 (never) to 3 (always). This instrument is unidimensional and has high reliability ($\alpha = 0.84$) according to its authors. Academic satisfaction levels were determined as follows: low (0 to 17 points) and high (18 to 24 points).

Mathematical and Statistical Methods

The collected data were downloaded from Google Forms in Excel format and subsequently processed in the statistical program SPSS version 25, after quality control of the database. Statistical analysis was conducted in two stages: a) Descriptive analysis, using frequency tables to characterize the students and describe the levels of research skills; and b) Inferential analysis, using the chi-square test and Fisher's exact test, considering a statistical significance level of $p < 0.05$.

Ethical considerations

The research complied with the ethical principles established in the Declaration of Helsinki for research involving human subjects. Authorization was obtained from the Research Studies Ethics Committee of the Faculty of Medicine of UNMSM, with code 0205-2025.

Participation was voluntary, and the anonymity and confidentiality of the information were guaranteed. Informed consent was obtained virtually by asking participants to select the "I accept" option after reading the corresponding document in the digital form.

RESULTS AND DISCUSSION

Table 1 presents the results corresponding to the characterization of the students by sex and age group. It is observed that the majority of participants in the study were female, with a frequency of 93.4 %; were aged 21 to 22 years, with a frequency of 37.2 %; and were in their third year of study, with a frequency of 39.0 %.

Table 1. Characteristics of the surveyed students. Professional School of Obstetrics. Universidad Nacional Mayor de San Marcos. Academic Period 2025-II

Characteristic	Frequency	%
Sex	-	-
Male	19	6,6
Female	271	93,4
Age group		
Up to 20 years	46	15,9
21 to 22 years	108	37,2
23 to 24 years	100	34,5
More than 24 years	36	12,4
Year of study		
Third year	113	39,0
Fourth year	73	25,2
Fifth year	104	35,9
Total	290	100,0

Source: Questionnaire of associated factors

Table 2 highlights that the research skills dimensions with the highest percentage of adequate level were the cooperative (85.2 %) and technological (76.2 %) dimensions; while the dimension with the lowest percentage was the analytical and interpretative (29.7 %). The total score shows a predominance of the adequate level, present in 55.9% of the students.

Table 2. Level of research skills in students. Professional School of Obstetrics. Universidad Nacional Mayor de San Marcos. Academic Period 2025-II

Research Skills Levels	Adequate Level		Inadequate Level	
	No.	%	No.	%
Exploratory Domain	165	56,9	125	43,1
Technological Domain	69	23,8	221	76,2
Methodological Domain	121	41,7	169	58,3
Analytical & Interpretative Domain	204	70,3	86	29,7
Written Communication Domain	101	34,8	189	65,2
Oral Communication Domain	132	45,5	158	54,5
Cooperative Domain	43	14,8	247	85,2
Total Score	128	44,1	162	55,9

Source: Research Skills Scale

Table 3 shows that the only personal factor that reached a significant association with research skills was "participation in research projects" ($p=0.015$).

Table 3. Personal factors associated with research skills. Professional School of Obstetrics. Universidad Nacional Mayor de San Marcos. Academic Period 2025-II

Factors		Research skills levels		Total	p-value
		Inadequate	Adequate		
Age	≤ 22 years	71 (55,5 %)	83 (51,2 %)	154 (53,1 %)	0,275
	>22 years	57 (44,5 %)	79 (48,8 %)	136 (46,9 %)	
Sex	Female	122 (95,3 %)	149 (92,0 %)	271 (93,4 %)	0,184
	Male	6 (4,7 %)	13 (8,0 %)	19 (6,6 %)	
Scientific society	Yes	3 (2,3 %)	4 (2,5 %)	7 (2,4 %)	0,628
	No	125 (97,7 %)	158 (97,5 %)	283 (97,6 %)	
Research Group	Yes	8 (6,3 %)	10 (6,2 %)	18 (6,2 %)	0,583
	No	120 (93,7 %)	152 (93,8 %)	272 (93,8 %)	
Extracurricular Courses	Yes	3 (2,3 %)	11 (6,8 %)	14 (4,8 %)	0,067
	No	125 (97,7 %)	151 (93,2 %)	276 (95,2 %)	
Participation in Research Projects	Yes	43 (33,6 %)	76 (46,9 %)	119 (41,0 %)	0,015
	No	85 (66,4 %)	86 (53,1 %)	171 (59,0 %)	
Top Third of class	Yes	61 (47,7 %)	77 (47,5 %)	138 (47,6 %)	0,539
	No	67 (52,3 %)	85 (52,5 %)	152 (52,4 %)	
Research competitions	Yes	17 (13,3 %)	34 (21,0 %)	51 (17,6 %)	0,059
	No	111 (86,7 %)	128 (79,0 %)	239 (82,4 %)	

*Fisher's exact test

Source: Questionnaire of associated factors

Table 4 shows that the institutional factors that achieved a significant association with research skills were the year of study ($p=0.049$), the publication of articles in journals indexed in the Scopus database ($p=0.016$), and participation in organizing academic events ($p=0.015$).

Table 4. Institutional factors associated with research skills. Professional School of Obstetrics. Universidad Nacional Mayor de San Marcos. Academic Period 2025-II.

Factors		Research Skill Levels		Total	p-value
		Inadequate	Adequate		
Year of Study	Third Year	60 (46,9 %)	53 (32,7 %)	113 (39,0 %)	0,049 ^a
	Fourth Year	28 (21,9 %)	45 (27,8 %)	73 (25,2 %)	-
	Fifth Year	40 (31,3 %)	64 (39,5 %)	104 (35,9 %)	-
Publication in Scopus-indexed Journals	Yes	0 (0,0 %)	7 (4,3 %)	7 (2,4 %)	0,016 ^b
	No	128 (100,0 %)	155 (95,7 %)	283 (97,6 %)	-
Publication in other databases	Yes	6 (4,7 %)	11 (6,8 %)	17 (5,9 %)	0,310 ^b
	No	122 (95,3 %)	151 (93,2 %)	273 (94,1 %)	
Participation in Organizing Academic Events	Yes	19 (14,8 %)	42 (25,9 %)	61 (21,0 %)	0,015 ^b
	No	109 (85,2 %)	120 (74,1 %)	229 (79,0 %)	
Academic Satisfaction	Low	37 (28,9 %)	35 (21,6 %)	72 (24,8 %)	0,098 ^b
	High	91 (71,1 %)	127 (78,4 %)	218 (75,2 %)	

a: Chi-square test; b: Fisher's exact test

Source: Questionnaire of associated factors and Academic Satisfaction Scale (ESA)

The results of this investigation indicate that the majority of Obstetrics students exhibit an adequate level of research skills, which suggests that while there is positive progress in research training, there is still a significant group of students who do not reach an adequate level in developing these competencies. This finding is similar to that reported by Vera et al.⁽¹²⁾ in Cuba, who identified a predominance of moderately adequate and adequate levels in the upper years of the medical career, reinforcing the idea that academic progress favorably influences the acquisition of research skills.

The analysis by domains allowed for the identification of marked differences in the level of development of research skills among Obstetrics students. In the exploratory domain, which includes the use of academic search engines, visits to specialized repositories and libraries, the use of documentary notecard techniques, the assessment of academic texts read, and the verification of their scientific backing, this study reported a predominance of the

inadequate level. This is similar to the findings described by Banu et al.,⁽¹³⁾ who identified a significant gap between required and observed skills in information search and management.

The analytical and interpretative domain presented the lowest results, revealing limitations in statistical handling, interpretation of results, and critical analysis capacity. This pattern coincides with Lorenzo et al.,⁽⁷⁾ who also reported deficiencies in the selection and application of statistical methods. This allows us to infer that the difficulty in analyzing and interpreting data constitutes a recurring weakness in university research training, demanding greater reinforcement in quantitative analysis competencies and scientific reasoning.

On the other hand, the cooperative domain obtained the best results, which evidences a high disposition for teamwork and collaboration among students during the research process. This finding reinforces the idea proposed by Maddens et al.,⁽¹⁴⁾ who reported that previous educational trajectory favors the development of research skills, especially in contexts where collaborative learning is part of the formative strategies.

The inferential analysis showed that participation in research projects is the only personal factor significantly associated with research skills in Obstetrics students. This coincides with what was reported by Imbert et al.,⁽¹⁵⁾ who found a significant correlation between the development of the final specialty work and research competencies, indicating that active participation in real research processes improves skill acquisition.

The institutional factors allowed for the identification of a significant association between research skills and the year of study, publication of articles indexed in Scopus, and the organization of academic events. The year of study as an associated factor coincides with the findings of Vera et al.⁽¹²⁾ in Cuba, who found significantly higher levels of research skills in students of upper years compared to those in initial years. This reflects the progressive accumulation of academic experience and research practice throughout the career, which allows them to become familiar with methodological procedures, the use of scientific sources, and the presentation of results.

Regarding the association between research skills and the publication of articles indexed in Scopus, the idea is reinforced that active participation in scientific production encourages the strengthening of advanced research capabilities, such as methodological rigor, academic writing, and critical evidence review.

Regarding limitations, as this is a correlational cross-sectional study, causal relationships between the analyzed variables cannot be established, only associations within the studied group can be identified. Furthermore, a response bias is possible, as research skills were evaluated using a self-report instrument, which carries a potential social desirability bias or an altered self-estimation by students regarding their own competencies. Finally, as the sample is specific to a single school within a national university, the external validity of the results is restricted, preventing their generalization to Obstetrics students from other institutions or different sociocultural contexts.

It is recommended that university institutions promote comprehensive strategies that include participation in projects, publication in high-impact journals, and the organization of academic events as part of the training process for future obstetricians.

Scientific contribution

Strengthening research skills in university training constitutes a key element to ensure professionals capable of generating and applying scientific knowledge in the health field. In this context, the present study provides empirical evidence on the level of development of these skills in Obstetrics students, demonstrating a global predominance of the adequate level, although with important differences between its domains. Specifically, it was identified that participation in research projects represents the main personal factor associated with the development of research skills, while institutional factors such as the year of study, publication of scientific articles in indexed journals, and participation in organizing academic events are significantly related to better levels of these skills. These findings allow for more precise guidance in designing formative research strategies within the Obstetrics program.

CONCLUSIONS

The factors associated with research skills in Obstetrics students at a Peruvian public university were determined, particularly those linked to research experience and the academic environment. These results highlight the importance of strengthening formative research through strategies that promote the active and sustained participation of students in academic and research activities.

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Declaration of interests

The authors declare no conflicts of interest.

Author contributions

Karen Lisseth Quenaya Amasifuén: Conceptualization, Funding Acquisition, Project Administration, Data Analysis, Writing – Original Draft, Writing – Final Report.

Zoila Rosa Moreno Garrido: Literature Review, Supervision, Writing – Original Draft.

Emilio Oswaldo Vega Gonzales: Literature Review, Data Analysis, Writing – Final Report.

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