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Factors that influence student scientific production in surgical sciences

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ABSTRACT

Introduction: research in surgical sciences is a vital tool for the health worker since it can provide results of interest such as the usefulness of diagnostic scales, behavior of a nosological entity, as well as encourage the exchange of knowledge among professionals about the basis of accumulated experiences. Objective: to characterize the factors that influence student scientific production in surgical sciences. Method: an observational, descriptive, cross-sectional study was carried out from September to November 2021. The universe was made up of 84 medical sciences students who are involved in surgical sciences and it was studied in its entirety. Descriptive statistics were used. Results: the age of the female sex was 21,5 + 1,87 and the male sex, 21,4 + 1,90. Female sex predominated (36,1 %). The fourth academic year (26; 30,9 %) and the medical degree (76; 90,5 %) stood out. Personal motivation for research stood out with 74 students and students with regular knowledge of research methodology predominated (46; 54,8 %). Conclusions: the accumulated research experience and basic knowledge constitute factors that determine the development of student scientific production, which should be put into practice by future researchers.

Keywords: Science; Students; Science, Technology and innovation indicators; Scientific and Technical Publications; Electronic Publications.

Scientific research, whose purpose lies in the publication of results, constitutes an integrating process; for its development, it combines necessary elements such as: problem to research, interest of the researcher, time to carry out the project and methodological knowledge acquired. The correct chaining of these factors leads to the positive impact of the results obtained in solving a specific problem[1].

In this sense, research in surgical sciences constitutes a vital tool for the health worker since it can provide results of interest such as the usefulness of diagnostic scales or the behavior of a nosological entity, as well as encourage the exchange of knowledge between professionals. based on accumulated experiences[1].

Research development is determined by factors that act as agonists or antagonists of the process. They are classified as personal factors (motivation towards research, time spent, study habits), academic factors (presence of advisers and their involvement in research, presence of research lines to be developed, institutional orientation towards research development, methodological training courses) and technological factors (easy access to digital information in databases or repositories and counting with technological devices)[1].

Castro-Rodríguez[2] considers that institutional factors have the greatest impact, followed by personal factors. On the other hand, in their analysis of scientific production in Matanzas, Álvarez et al.[3] highlighted the lack of knowledge of a large part of the researchers, regarding the existence of journals to publish their results.

Scientific production related to surgical specialties is not exempt from the impact of these factors. Cartes-Velásquez et al.[4] and Moraga et al.[5] consider that the scientific development regarding surgical sciences has grown, however, when compared with the scientific activity in medical sciences students in Cuba, no similarity is observed, as expressed by Jiménez et al.[6].

Scientific activity constitutes an important link in the training of professionals of the health sector. In

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this sense, knowing the factors that influence their development, as well as their behavior, allows to provide students with tools for their improvement. For this reason, it is proposed as an objective to characterize the factors that influence student scientific production in surgical sciences.

METHOD

Type of study: an observational, descriptive, cross-sectional study was carried out from September to November 2021 on the factors that influence student scientific production in surgical sciences.
Universe and sample: the universe was made up of 84 students that belong to the Universities of Medical Sciences of Cuba that are linked to surgical sciences, who expressed their willingness to participate in the research by filling out the questionnaire. The entire universe was studied.
Variables and data collection: the analyzed variables were: age, sex, academic year, degree (Medicine; not including the sixth academic year, Stomatology, degrees including Clinical Bioanalysis, Short-cycle Advanced Technician) and dichotomous variables: surgical science-related publications, personal motivation for research, knowledge of the guidelines to prepare articles, knowledge of scientific journals for the dissemination of results, easy access to information (bibliography and/or data), advice on research, availability of time for research, having received Research Methodology courses, rejection to publish due to an increase in editorial corrections.

In addition, the variables "level of knowledge about research methodology" (high, regular, low) and "types of articles published and according to preferences" (review articles, original articles, case presentations) were studied.

The information was collected from an elaborate survey (Available at Complementary Files to the article) and applied through Google Forms.

High knowledge was defined as: use of a database with high standards of validity, credibility and security in the search for information; application of metric and parametric tests, variables of the studies (epidemiological, socio-demographic, among others) and statistics of absolute and percentage frequency; not incurring in micro and/or macrowriting errors[7,8].

Regular: use of Google Scholar for bibliographic searches; application of descriptive and percentage statistics; compliance with methodological and/or scientific writing standards with minimal grammatical and/or spelling errors[7,8].

Low: use of Google as a search engine; use only numbers and percents; non-compliance with the basic aspects related to the methodology according to the type of article; make scientific writing errors (excessive use of gerunds, words ending in ly, repetition of ideas and/or words). Other aspects of interest conceived as macro and micro writing errors[7,8].
Statistical processing: a database was created in Microsoft Excel 2010 for processing information. Descriptive statistics were used for data analysis using the mean, standard deviation and the statistical function of frequency.
Ethical standards: during the research development, no interventional techniques were applied to the participants. The applied survey was anonymous and confidential. Each participant confirmed their informed consent by filling out the survey. It was approved by the Ethics Committee and the Scientific Council of the Faculty of Medical Sciences "Dr. Raúl Dorticós Torrado". The Cuban ethical standards for research in health sciences and the II Declaration of Helsinki were complied with. Distinctive personal data of the participants were not collected and/or requested. The information was used for research purposes and for the sake of scientific development.

RESULTS

The age in the female sex was found in a range of 21,5 ± 1,87 and in the male sex of 21,4 ± 1,90.
A predominance of female sex was observed among the participants (36,1 %). The fourth academic year stood out (30,9 %) and 90,5 % corresponded to the Medicine degree (Table 1).

Personal motivation for research stood out with 74 students (88,1 %), however 71,4 % of the students do not have previous publications (Table 2).
Students with regular knowledge regarding research methodology predominated, representing 54,8 % (Table 3).

Review articles stood out among those published and case presentations, within the preferences, with 56 students each (Table 4).

DISCUSSION

The research development, together with the publication of results, constitutes a vital tool for the scientific-technical and social development of a territory, a consideration that supports the importance that the Universities of Medical Sciences confer on this pillar within the formation of their students.

Santana-Lopez et al.[9] agree with the present research regarding the predominance of female sex, an aspect that speaks in favor of their high participation in scientific activity. However, previous studies such as the one carried out by Morales et al.[10] exposes, in a precise manner, some determinants that justify the scarcity of publications by female authors in the literature on this field, which contradicts the results of this study. Likewise, Alarco et al.[11] analyzed the scientific productivity between both sexes and found that only 17,3 % of

the analyzed research corresponded to female sex.

Table 1. Distribution of the participants according to sex, academic year and degree. Universities of Medical Sciences of Cuba. September to November 2021		
Sex	No.	%
Female	53	63,1
Male	31	36,9
Academic year	No.	%
First year	11	13
Second year	16	19
Third year	17	20,2
Fourth year	26	30,9
Fifth year	14	16,7
Degree	No.	%
Medicine	76	90,5
Stomatology	2	2,4
Bachelor's degrees	4	4,8
Short-cycle advanced technician	2	2,4

Source: applied survey.

Table 2. Factors that influence student scientific production in surgical sciences.		
Factors	Yes	No.
	No. (%)*	No. (%)*
Publications related to surgical sciences	24 (28,6)	60 (71,4)
Personal motivation for research	74 (88,1)	10 (11,9)
Knowledge of the guidelines for the preparation of scientific articles	65 (77,4)	19 (22,6)
Knowledge of scientific journals (student or postgraduate) for the dissemination of information	56 (66,7)	28 (33,3)
Easy access to information (bibliography and/or data)	37 (44)	47 (55,9)
Research advice	48 (57,1)	36 (42,9)
Arrangement of time for research	50 (59,5)	34 (40,5)
Research Methodology Courses	65 (77,4)	19 (22,6)
Rejection to publish due to an increase of editorial corrections	29 (34,5)	55 (65,5)

*n=84

Table 3. Level of knowledge about research methodology		
Knowledge level	No.	%
High	33	39,3
Regular	46	54,8
Low	5	5,9
Total	84	100

Table 4. Distribution of students according to types of published articles and/or preference				
Item Type	Published		Preferably	
	No.	%*	No.	%**
Review Articles	56	54,9	37	30,8
Original articles	11	10,8	27	22,5
Case Presentation	35	34,3	56	46,7

*n=102 **n=120

The results presented by Vera-Rivero et al.[12] contradict what was obtained in the present study regarding the academic year standing out. For their part, Blanco et al.[13] and Rodriguez-Abrahantes et al.[14] coincide with the results according to the training career, while Bermello-Navarrete et al.[15] disagrees with them.

The difference between the results found may be determined by the divergence between the research according to the proposed methods and the studied samples. Similarly, the predominance of the degree in Medicine is due to the fact that it involves greater areas of knowledge compared to other undergraduate specialties; therefore, a greater number of investigations are generated. In addition to this, the accumulated experiences in the research area during the years of training, can also justify the predominance of the fourth academic year.

The investigative development of medical students is considered a fundamental link in their training. It has been stated that the investigative task is marked by the acquisition, consolidation and application of theoretical knowledge in the scientific field. However, the authors consider that this aspect is wider when analyzed from practice.

In this sense, presenting publications or research papers with results can influence the scientific production of students. This factor allows the student to be provided with tools and/or basic skills that enable the rapid dissemination of information and results with the least number of possible errors. Based on what was obtained, it can be considered a determinant that justifies the reduced number of publications referring to the surgical area found by Jiménez et al.[6] and Diaz-Samada et al.[16] in their two analyzed periods.

The availability of time and motivation for research are aspects that, in the authors' opinion, go side by side. In this sense, medical students, as a result of the teaching-assistance load implied by health sciences degrees, must make a greater effort to give rise to the investigative profile conceived in their curricular plan; what translates into a greater workload. As a result, it becomes the importance of motivation and/or institutional advice with the aim of encouraging the student to make research, not only for the sake of complying with this, but for their training as a future professional. Authors such as Corrales-Reyes et al.[17] and Mamani-Benito et al.[18] agree with the above.

It is valid to highlight, according to the authors' considerations, that all the analyzed factors that can influence student production are summed up during the editorial review of an article. In this sense, the delay in the editorial process may be due to: ignorance of the presentation rules, journals in which to publish or due to the presence of basic errors in the writing and/or in the methodological order. Undoubtedly, these elements are corrected with adequate experience in editorial management and advice. In the same way, the dilation of the process demands more time from the student and can lead to disinterest in the publication, which falls on the importance of upholding a research culture in the students as referred by Castro-Rodríguez[19].

Knowledge on publication standards and research methodology are necessary elements during the preparation and presentation of research. According to the results obtained, the authors consider that greater preparation is required in students[20]. It can be done on the basis of didactic courses where the essential and indispensable tools are provided; since its improvement is achieved with daily practice.

The wide possibility of modalities of work presentations, either in editorial reviewing or in scientific events, requires preparation in the essential characteristics of each typology. The predominance of review articles and the small number of original articles may be in correspondence with the level of knowledge; according to the authors' criteria.

In their preparation, original articles with respect to reviews, imply information and data collection, the approach of a method that serves as a guide for the study and an in-depth analysis of the obtained results, where personal criteria, possible justifications and results are contrasted.

CONCLUSIONS

The accumulated experience in research and essential knowledge are factors that determine the development of student scientific production, which must be put into practice by future researchers.

AUTHORSHIP

Luis Enrique Jiménez-Franco: conceptualization, research, data curation, formal analysis, project management, writing-original draft, writing-revision and editing.
Claudia Díaz-de-la-Rosa: conceptualization, research, formal analysis, project management, validation, supervision, writing, review and editing.
Naila García-Pérez: data curation, formal analysis, research, writing-original draft, writing-revision and editing.

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Factores que influyen en la producción científica estudiantil en las ciencias quirúrgicas

ABSTRACT

Introducción: las investigaciones en las ciencias quirúrgicas constituyen herramientas vitales para el trabajador de la salud ya que pueden aportar resultados de interés como la utilidad de escalas diagnósticas, el comportamiento de una entidad nosológica, así como incentivar el intercambio de conocimiento entre los profesionales sobre la base de las experiencias acumula-

das. Objetivo: caracterizar los factores que influyen en la producción científica estudiantil en las ciencias quirúrgicas. Método: se realizó un estudio observacional, descriptivo, de corte transversal de septiembre a noviembre de 2021 con estudiantes de la universidades de ciencias médicas de Cuba. El universo quedó conformado por 84 estudiantes de ciencias médicas que se encontraban vinculados a las ciencias quirúrgicas y se trabajó con su totalidad. Se utilizó la estadística descriptiva. Resultados: la edad en el sexo femenino se encontró en un rango de 21,5 + 1,87 y en el masculino de 21,4 + 1,90. Predominó el sexo femenino (36,1 %).Sobresalió el cuarto año (26; 30,9 %) y la carrera de Medicina (76; 90,5 %). Destacó la motivación personal por la investigación con 74 estudiantes y predominaron los estudiantes con conocimientos regulares referentes a Metodología de la Investigación (46; 54,8 %). Conclusiones: la experiencia acumulada en la investigación y los conocimientos básicos constituyen factores que determinan el desarrollo de la producción científica estudiantil, los cuales deben ser puestos en práctica por los futuros investigadores.

Palabras clave: Ciencia; Estudiantes; Indicadores de ciencia, tecnología e innovación; Publicaciones Científicas y Técnicas; Publicaciones Electrónicas.