







## ORIGINAL RESEARCH

## Publication of works presented in the 2016 and 2018 editions of the National Student Scientific Event on Internal Medicine -MEDINTÁVILA

*Publicación de los trabajos presentados en las ediciones 2016 y 2018 del Evento Científico Estudiantil Nacional de Medicina Interna - Medintávila*

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### Abstract

**Introduction:** Much of the research works developed by students and presented in scientific events are not published in scientific journals.

**Objective:** To characterize the research works presented in the 2016 and 2018 editions of the Evento Científico Estudiantil Nacional de Medicina Interna (National Student Scientific Event on Internal Medicine - (MEDINTÁVILA) and those published in scientific journals, as well as to identify factors associated with their publication.

**Materials and methods:** Cross-sectional analytical study. A search strategy was carried out in April 2020 in Google Scholar in order to verify if the works presented in the 2016 y 2018 editions of the event had been published, in English or Spanish, in scientific journals. Bivariate analyses were performed to determine whether there were characteristics of the works associated with their publication, calculating prevalence ratios, along with their corresponding 95% confidence intervals and *p*-values and using generalized linear models (family=Poisson; link=log) in which each university submitting the research work was used as a cluster. A significance level of  $p < 0.05$  was considered.

**Results:** Out of the 335 research works analyzed, 180 (53.73%) were presented at the 2016 edition. Regarding typology and the topics they addressed, 190 (56.72%) were classified under the free topics category, and 170 addressed chronic illnesses (50.75%). A total of 24 works were published (7.16%), of which only 9 were cited, and there were authoring changes in 19 (79.17%). No factors associated with the publication of the works were identified in the bivariate analysis.

**Conclusion:** The publication in scientific journals of the research works presented in both editions of the event is very low, thus it is necessary for Cuban universities to provide medical science students with more research-related support, since this could increase the probability of publishing their works.

### Resumen

**Introducción.** Muchas de las investigaciones desarrolladas por estudiantes y presentadas en eventos científicos no se publican en revistas científicas.

**Objetivos.** Caracterizar los trabajos presentados en las ediciones 2016 y 2018 del Evento Científico Estudiantil Nacional de Medicina Interna (Medintávila) y los publicados en revistas científicas, así como identificar los factores asociados a su publicación.

**Materiales y métodos.** Estudio transversal analítico. Mediante una estrategia de búsqueda realizada en abril de 2020 en Google Académico, se constató si los trabajos presentados en 2016 y 2018 en el evento habían sido publicados, en inglés o español, en revistas científicas. Se realizaron análisis bivariados para determinar si hubo características de los trabajos asociadas con su publicación, calculándose razones de prevalencia, junto con sus respectivos intervalos de confianza al 95% y valores *p* mediante modelos lineales generalizados (familia Poisson, función de enlace log) en los que se usó como clúster a cada universidad que presentó la investigación. Se consideró un nivel de significancia de  $p < 0.05$ .

**Resultados.** De los 335 trabajos analizados, 180 (53.73%) correspondieron a la edición de 2016. Respecto a la tipología y temática, 190 (56.72%) fueron clasificados bajo la categoría Temas libres y 170 (50.75%) abordaron Enfermedades crónicas. Se publicaron 24 (7.16%) trabajos, de los cuales solo 9 fueron citados, y en 19 (79.17%) hubo cambios de autores. No se identificaron factores asociados a la publicación de los trabajos en el análisis bivariado.

**Conclusión.** La publicación en revistas científicas de los trabajos presentados en ambas ediciones del Medintávila es muy baja, por lo que es necesario que las universidades cubanas brinden más apoyo en investigación a los estudiantes de ciencias médicas, ya que esto podría aumentar las probabilidades de publicación de sus trabajos.



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## Introduction

Student scientific activities (SSA) are an essential element of teaching; they are defined as a set of techniques, tools and processes in which students participate that allow them to acquire their own skills for research development. These processes are usually carried out using the scientific method and under the guidance of a university professor or researcher.<sup>1</sup>

In Cuba, there are multiple options available for developing SSA in undergraduate programs, ranging from research scholarships in specific disciplines to scientific events.<sup>2-5</sup> Among the latter, the National Student Scientific Event on Internal Medicine (Medintávila) is recognized for its systematicity and scientific quality; it is held every two years since its foundation in 2014 and is organized by the Universidad de Ciencias Médicas de Ciego de Ávila (UCMCAV) and its Student Scientific Group (GCE).

Although the conditions for the development of quality SSA in undergraduate medical programs in Cuba are recognized, students face a very important challenge: the publication of their findings, which is the final phase of the research process.<sup>6</sup> This is of great importance because, while research is crucial, so is publishing the results, as there is no doubt that the publication will transcend and open the door to reach more researchers and decision-makers in health.

In Latin America, it has been reported that the publication of papers presented at scientific congresses is low. Toro-Polo *et al.*<sup>7</sup> found that only 52 (9.8%) of the 532 papers presented at the National Scientific Congress (CCN) of the Peruvian Scientific Society of Medical Students (SOCIMEP) between 2002 and 2009 were published, while Valladares-Garrido *et al.*<sup>8</sup> found that only 83 (10.98%) of 783 papers presented at international medical congresses in Latin America between 2011 and 2014 were published. Moreover, in Cuba, Corrales-Reyes *et al.*<sup>9</sup> found that of 498 papers presented at the 2015 International Congress of Dentistry held in Havana, only 61 (12.24%) were published; Corrales-Reyes *et al.*<sup>10</sup> stated that of the 40 research papers presented at the 4<sup>th</sup> Ibero-American Meeting of Dental Students, held within the framework of the 2015 International Congress of Dentistry held in Havana, only 5 (12.5%) were published; finally, Corrales-Reyes *et al.*<sup>11</sup> found that of the 537 papers presented at the national medical student forums carried out in Cuba in 2016 and 2017, only 62 (11.55%) were published.

Despite the existence of these last three studies, the publication of papers prepared by students and presented at scientific congresses in Cuba has not been studied. Therefore, the objective of this study was to characterize the works submitted to the 2016 and 2018 editions of the Medintávila event and those published in scientific journals, as well as to identify the factors associated with their publication.

## Materials and methods

Analytical cross-sectional study. The research works presented in the 2<sup>nd</sup> and 3<sup>rd</sup> editions of Medintávila, held from November 16 to 19, 2016, and April 4 to 8, 2018, respectively, were analyzed. Of the 422 papers presented (255 in 2016 and 167 in 2018), 87 were excluded because they did not include all the variables to be evaluated, so the final sample was 335 papers.

Variables and search methods were defined as outlined in the study by Corrales-Reyes *et al.*<sup>11</sup> The variable of interest studied was “publication,” which was characterized as the publication in a scientific journal of the work presented at the event; the study was conducted two years after the latest edition of Medintávila (2018), a time lapse considered adequate for obtaining a speedy post-publication citation. A published work was defined in this context as one in

which there was a correspondence between the work presented at the event and the article published in terms of topic, place of study, main results, and at least one author. The works contained in the abstract books of the Universidad Médica Pinareña student journal were not considered as publications because they only included title, authors, affiliations, abstract, and key words.

The research works presented at the event were made available *in extenso* by the GCE of the UCMCAV; they were reviewed between April 2019 and March 2020 to collect the information on the variables to be analyzed and enter it into a Microsoft Excel database. The study variables were: title; university where the authors studied; thematic areas (predetermined by the organizers of the event in each call); language of presentation (Spanish and English); edition of the event (2016 or 2018); type; number of authors; academic year and degree of the first author (medicine, oral medicine, nursing, and health technology degrees); participation of tutors/advisors (yes or no); awards (no award, relevant award, outstanding award, and mention award); number of references, and obsolescence (Price index).

Each work was classified into one of the following thematic areas: primary health care; chronic diseases; infectious diseases; herbal and traditional medicine; children and women; elderly; medical education; emergencies; and interdisciplinarity. Furthermore, according to their type, works were classified into free topics, finished research works, literature reviews, and case reports. The Price index was computed by dividing the number of references  $\leq 5$  years old (relative to the date of the event) by the total number of references cited in each paper.

The works classified as free topics and finished research works (both with a structure including Introduction, Materials and Methods, Results, and Discussion, or their equivalents) (n=208) were also grouped according to their methodological characteristics into: a) design: case series/report, cross-sectional, cases and controls, cohorts, experimental, and others; b) intervention: observational, experimental, or quasi-experimental; c) objective according to data analysis: descriptive or analytical; d) temporality (defined by the time data was collected): retrospective, prospective, or ambispective; e) patient follow-up: cross-sectional or longitudinal study; and e) multicenter study (defined as one that was carried out under the same methodology using data from at least two research centers or care units): yes or no.

To determine whether the papers were published in scientific journals, a search strategy was developed, in Spanish and English, consisting of a combination of terms that included the subject and place, as well as the name of the first, second and last authors of the study, as shown below: («Tema de estudio» AND «lugar de estudio») AND (autor: primero OR autor: segundo OR autor: último) and («Study topic» AND «study place») AND (author: first OR author: second OR author: last). The search, which was developed in April 2020, was performed in Google Scholar since this search engine has the capacity to locate articles and citations in journals indexed in the most important databases and, because of its low power of exclusion, it accepts most publications, even those that do not appear in the most widely used databases.

Articles classified as published were evaluated for the following characteristics: (A) title (to determine if there were changes); (b) journals with their corresponding country of publication and indexing (SciELO, Web of Science, PubMed/MEDLINE, and Scopus); (c) year of publication; d) number of citations according to Google Scholar (search performed on September 8, 2020); e) authors (to determine if there were changes: addition, exclusion, order, and mixed); and f) language of publication.

Data analysis was performed using descriptive statistics: absolute and relative frequencies were used for categorical variables, while means and standard or median

deviations and interquartile ranges were calculated for numerical variables, according to the assumptions of normality determined through the Shapiro-Wilk test. Bivariate analyzes were performed to determine whether there were characteristics of the papers associated with their publication in scientific journals, calculating crude prevalence ratios (cPR), adjusted prevalence ratios (aPR), and their corresponding 95% confidence intervals (95%CI);  $p$ -values were also calculated using generalized linear models (Poisson regression, log link function) in which each university presenting the research was used as a cluster. Statistical analysis was carried out using the Stata v.11.1 software and a significance level of  $p < 0.05$  was considered.

The study followed the recommendations for conducting research with secondary data and preserved the confidentiality of the information obtained. As this is a research done using publicly available data, no approval by an ethics committee was required.

## Results

Of the 335 papers analyzed, 180 (53.73%) were presented during the 2016 event. As for the variables analyzed, it was found that the principal authors of 97 (28.96%) papers were enrolled in UCMCAV, that 170 (50.75%) addressed the topic of chronic diseases, and that 190 (56.72%) were classified under the category free topics. The remaining descriptive characteristics are shown in Table 1.

**Table 1.** Characteristics of the papers presented in the two editions of the event (n=335).

Variable		n	%
Years of presentation	2016	180	53.73
	2018	155	46.27
University	UCM in Ciego de Ávila	97	28.96
	UCM in Pinar del Río	50	14.92
	UCM in Sancti Spíritus	30	8.96
	UCM in Las Tunas	23	6.87
	UCM in Cienfuegos	22	6.57
	UCM in Villa Clara	19	5.67
	UCM in Granma	18	5.37
	UCM in Holguín	18	5.37
	UCM in Santiago de Cuba	14	4.18
	UCM in Guantánamo	11	3.28
	UCM in La Habana	10	2.99
	Medical Sciences Branch at Isla de la Juventud	9	2.68
	UCM in Matanzas	9	2.68
	UCM in Camagüey	3	0.90
	Faculty of Medical Sciences of Artemisa	1	0.30
Universidad Americana de Puebla	1	0.30	

**Table 1.** Characteristics of the papers presented in the two editions of the event (n=335). (continued)

	Variable	n	%
Thematic areas	Chronic diseases	170	50.74
	Children and women	36	10.74
	Infectious diseases	28	8.36
	Medical education	22	6.57
	Interdisciplinarity	21	6.27
	Emergencies	18	5.37
	Primary healthcare	16	4.78
	Elderly	15	4.48
	Herbal and traditional medicine	9	2.69
Type	Free topics	190	56.72
	Literature reviews	107	31.94
	Case reports	20	5.97
	Finished research works	18	5.37
Number of authors	1	17	5.07
	2	47	14.03
	3	270	80.60
	5	1	0.30
Tutor/Advisor	Yes	320	95.52
	No	15	4.48
Degree of the first author	Medicine	306	91.34
	Dentistry	24	7.16
	Nursing	3	0.90
	Healthcare technologies	2	0.60
Academic year of the first author	First	24	7.16
	Second	63	18.81
	Third	74	22.09
	Fourth	101	30.15
	Fifth	66	19.70
	Sixth	7	2.09
Awards	Not awarded	266	79.40
	Mention	24	7.16
	Outstanding	22	6.57
	Relevant	23	6.87

UCM: Universidad de Ciencias Médicas.

Source: Own elaboration.

Regarding the design of the studies analyzed, 88 were cross-sectional (42.31%), 139 were retrospective (66.83%), 154 were descriptive (74.04%), 168 were observational (80.77%), and 108 were longitudinal (51.92%). All were single-center studies (Table 2).

**Table 2.** Design characteristics of free topics and finished research works (n=208).

	Variable	n	%
According to design	Cross-sectional	88	42.31
	Cohort	32	15.38
	Case-control	16	7.69
	Experimental	5	2.40
	Other	67	32.21
According to temporality	Retrospective	139	66.83
	Prospective	63	30.29
	Ambispective	6	2.88
According to objective	Descriptive	154	74.04
	Analytical	54	25.96
According to intervention	Observational	168	80.77
	Quasi-experimental	34	16.35
	Experimental	6	2.88
According to measurements	Longitudinal	108	51.92
	Cross-sectional	100	48.08

Source: Own elaboration.

Of the 10 201 references identified in the 335 papers, most (n=6 418) were found in free topics studies; in addition, the average number of references included per article was the highest in this type of study (33.78). It was also found that the majority of references published in the last 5 years (n=5 972) were in free topic studies (n=3 705); however, the lowest degree of obsolescence (Price index) was found in papers classified as finished research works (0.76) (Table 3).

**Table 3.** Analysis of bibliographic references according to paper type.

Type	n	Total references	Average per paper	≤ 5 years	Price Index
Free topics	190	6 418	33.78	3 705	0.58
Literature reviews	107	3 133	29.28	1 777	0.57
Case reports	20	274	13.70	204	0.74
Finished research works	18	376	20.89	286	0.76
Total	335	10 201	30.45	5 972	0.59

Source: Own elaboration.

Of the 335 papers presented, only 24 (7.16%) were published, 1 in English (in the Chilean Journal of Oral Research indexed in Scopus) and the rest in Spanish. Students managed to publish their papers in 13 scientific journals (11 Cuban, 3 of them student journals) indexed mainly in SciELO. The journals *Universidad Medica Pinareña* and *16 de Abril*, both student journals, had the highest number of articles published (Table 4).



On the other hand, the UCMCAV and the Universidad Médica de Pinar del Río published the largest number of articles, with 9 and 5, respectively. The predominant form of publication was original articles (n=16; 66.67%). At the time of preparation of this study, the articles had been cited 20 times, with an average of 0.83 citations per document, and 62.50% (n=15) had not been cited (Table 4).

**Table 4.** Characteristics of published papers (n=24).

Journal	Country	n	Type			Citations	CA	CT
			ART	REV	CP			
Universidad Médica Pinareña *	Cuba	6	2	4	-	4	5	5
16 de Abril *	Cuba	5	4	1	-	1	3	4
CorSalud †	Cuba	2	2	-	-	3	2	1
Revista Finlay †	Cuba	2	1	1	-	1	2	1
Journal of Oral Research ‡	Chile	1	1	-	-	2	-	-
Archivos del Hospital Universitario General Calixto García	Cuba	1	1	-	-	0	1	-
Revista Cubana de Ginecología y Obstetricia †‡	Cuba	1	1	-	-	0	1	-
Medical Education	Spain	1	1	-	-	5	-	-
MediCiego	Cuba	1	-	1	-	3	1	-
Revista de Ciencias Médicas de Pinar del Río †**	Cuba	1	1	-	-	0	1	-
Revista Cubana de Medicina †	Cuba	1	-	-	1	0	1	1
Revista Médica Electrónica †	Cuba	1	1	-	-	1	1	-
UniMed *	Cuba	1	1	-	-	0	1	1
Total	-	24	16	7	1	20	19	13

ART original articles; REV: review articles; CP: case presentation; CA: changes in authors; CT: changes in title.

\* Student journal.

† Journal indexed in SciELO.

‡ Journal indexed in Scopus.

\*\* Journal indexed in SciELO.

Source: Own elaboration.

Changes in authors were observed in 19 articles (79.17%): 2 with additions, 1 with an exclusion, 2 with changes in order, 13 with mixed changes, and 1 in which the authors of the publication were completely different from those who presented the paper at the event. Titles were changed in 13 (54.17%) articles.

As for the year of publication, it was found that 2 (8.33%) papers were published in 2016; 5 (20.83%) in 2017; 10 (41.67%) in 2018; and 7 (29.17%) in 2019.

In the bivariate analysis, none of the categories established to define the characteristics of the papers were significantly associated with their publication in scientific journals. The only subcategory in which a significant association was observed was the degree of the first author, where it was determined that the works in which the first author was a nursing student were more likely to be published than those in which the first author was a medical student (cPR: 16.10; 95%CI: 8.35-31.03;  $p < 0.001$ ). Table 5.

**Table 5.** Bivariate analysis of the association between the characteristics of the papers and their publication (n=335).

Variable		cPR (95%CI) p-value
Event edition	First	Comparison category
	Second	0.83 (0.48-1.42); $p=0.495$
Type	Free topics	Comparison category
	Literature reviews	0.83 (0.37-1.84); $p=0.644$
	Case presentation	1.27 (0.28-5.76); $p=0.760$
	Finished research works	No convergence
Tutor or advisor	No	Comparison category
	Yes	0.52 (0.15-1.82); $p=0.304$
Temporality	Retrospective	Comparison category
	Prospective	0.72 (0.32-1.65); $p=0.441$
	Ambispective	No convergence
Objective of the study	Descriptive	Comparison category
	Analytical	2.18 (0.99-4.80); $p=0.054$
Quantitative variables	Academic year	0.87 (0.62-1.23); $p=0.440$
	Number of authors	0.62 (0.32-1.20); $p=0.157$
Type of intervention	Observational	Comparison category
	Experimental	No convergence
	Quasi-experimental	0.69 (0.20-2.32); $p=0.545$
Measurement type	Cross-sectional	Comparison category
	Longitudinal	0.73 (0.27-1.95); $p=0.526$
Study design	Cross-sectional	Comparison category
	Case-control	2.36 (0.76-7.30); $p=0.137$
	Cohorts	0.39 (0.11-1.43); $p=0.157$
	Experimental	No convergence
	Other	0.92 (0.42-2.04); $p=0.845$
Awards	None	Comparison category
	Relevant	1.22 (0.49-3.00); $p=0.669$
	Outstanding	1.27 (0.34-4.78); $p=0.721$
	Mention	0.58 (0.16-2.16); $p=0.419$
Degree of the first author	Medicine	Comparison category
	Dentistry	1.34 (0.24-7.50); $p=0.737$
	Nursing	16.10 (8.35-31.03); $p<0.001$

cPR: Crude prevalence ratios.

Source: Own elaboration.

## Discussion

It is essential that, from the beginning of their academic training, students understand the types of research they can conduct and the areas in which they can delve deeper, as this will allow them to graduate with the ability to conduct research of varying levels of complexity based on the requirements of the residence and with the opportunity to



pursue a master's degree or a scientific degree. In this regard, Castro-Rodríguez<sup>12</sup> suggests that when a student enters the scientific field, the exploratory and descriptive levels are the most appropriate for first entering a line of research.

The present study found that none of the papers presented at the 2016 and 2018 Medintávila events were of a multicenter type, which is similar to what Corrales-Reyes *et al.*<sup>11</sup> reported in their study, where they found that of the 537 papers presented at the national medical student forums carried out in Cuba in 2016 and 2017, only 1 (0.18%) was of this type. In turn, Escobar-Salinas & Aveiro-Robalo,<sup>13</sup> in a study in which they surveyed 231 medical students from Latin America to learn about their participation in multicenter projects, found that 75.8% (n=175) claimed that they had never participated in a project of this type, while 11.7% (n=27) stated that they had participated in a multicenter project competition, and only 3% (n=7) published the results of these projects in a scientific journal; it was also evident that there is a high interest in participating in this type of research.

Given the scenario, and in order to encourage the participation of students in multicenter projects, the Latin American Federation of Scientific Societies of Medical Students (FELSOCEM) developed a competition to present projects of this type at its congresses;<sup>14</sup> however, Cuba's participation in this competition is practically non-existent. This may be explained by the fact that, despite the existence of a national articulation of student scientific groups, they are aimed at organizing the SSA and not at creating collaborative research teams in certain areas of knowledge. It may also be related, among other factors, to the lack of knowledge of the advantages of carrying out research in collaboration with other colleagues, which undoubtedly strengthens the research team as it can access collective wisdom.

The current level of obsolescence of the references used in the studies analyzed is medium to high (Price index: 0.57 to 0.76) according to the classification of Paz-Enrique *et al.*,<sup>15</sup> a figure much higher than the 0.46 reported by Madero Durán *et al.*<sup>16</sup> for the 5 045 references identified in a study that aimed to determine the scientific production of the *Revista Cubana de Pediatría* between 2012 and 2018. This difference could be explained by the rules of the Medintávila event regarding the presentation of papers, which require that more than 50% of the references be published within the last 5 years. It is important to mention that no other bibliometric assessments of similar events that determined the Price index were found.

The students published their papers in 13 scientific journals indexed mainly in SciELO, and of the 24 published works, half were published in student journals, being the journals *Universidad Médica Pinareña* (n=6) and *16 de Abril* (n=5) the most frequent publishing destinations. This finding is similar to that reported by Corrales-Reyes *et al.*<sup>11</sup> in their study with the 537 papers submitted to the 2016 and 2017 national medical student forums, where they found that these same student journals were the most frequent editorial destinations of the 62 published papers (n=8 and n=16, respectively). Nonetheless, it is worth noting that only 38.70% of the 62 papers classified as published in the study by Corrales Reyes *et al.*<sup>11</sup> were published in student journals, a lower percentage than that identified in the present study (45.83%; n=11). This difference could be attributed to the fact that students are unaware that biomedical journals exist to publish their work and that, within these journals, student journals are ideal spaces for this purpose.

Concerning publication in national scientific journals, the present study found that most of the papers were published in Cuban journals (91.6%). This is consistent with the findings of Ortiz Martínez *et al.*,<sup>17</sup> who reported a high prevalence of publication in national journals of the research papers presented by medical students in the 2014 and 2015 editions of the Colombian Student Medical Research Congress (CECIM), where, of the 9

papers published (out of a total of 87 papers presented), 87.5% (n=8) were published in Colombian journals.

Students should have a culture of publication that enables them to successfully complete the research process and thus fulfill the responsibility to contribute to scientific knowledge. For this, they must be clear that scientific journals are the most important means of dissemination for science and, therefore, they play an important role in the development of medical knowledge. In this sense, it is necessary to keep in mind that, as indicated by Valladares-Garrido *et al.*,<sup>18</sup> training in research skills and membership in scientific groups can increase knowledge of scientific journals among medical students.

The present study found a low frequency of publication of the research submitted to the 2016 and 2018 editions of the Medintávila event (7.16%), a frequency that, in fact, is lower than that described by similar studies conducted in Cuba: 26.56% (17 of 64 evaluated investigations) according to Ramos-Cordero *et al.*,<sup>19</sup> 11.55% (62 of 537 research works evaluated) according to Corrales Reyes *et al.*<sup>11</sup> and 10% (8 of 80 studies evaluated) according to Diaz-Samada *et al.*<sup>20</sup> It is important to mention that, at the time of preparation of this study, no bibliometric assessments of events in the country other than the national medical student forums had been conducted.

Similarly, higher publication frequencies have also been found in international events: 12.5% (5 of 40 investigations) according to Corrales-Reyes *et al.*<sup>10</sup> for the papers presented at the 4<sup>th</sup> Ibero-American Meeting of Dental Students in 2015, and 10.60% (83 of 783 investigations) according to Valladares-Garrido *et al.*<sup>8</sup> for the papers presented at international scientific congresses of Latin American medical students held between 2011 and 2014. In Colombia, Ortiz-Martinez *et al.*<sup>17</sup> found that of the 87 papers submitted to CECIM, only 9 (10.34%) were published, while in Peru, Toro-Polo *et al.*<sup>7</sup> established that of the 532 papers presented to the national scientific congresses of medical students in Peru held between 2002 and 2009, only 52 (9.8%) were published.

It is worth mentioning that although the figures obtained in other studies, both in Cuba and in other countries, are higher than those found in the present research, none of them satisfies the expectations nor correspond to the current potential of student scientific research in Latin America.

One of the factors that may influence the low publication of the research presented at congresses in Cuba is the change in the research rules that regulate SSA (Scientific Research Presentation Style or "EPIC Standards"<sup>21</sup> to the Research Methodology for Health Sciences proposed by Artiles-Visbal *et al.*<sup>22</sup>), because all student events that take place in the country must comply with these standards.

The structure of the current Research Methodology for Health Sciences<sup>22</sup> implies that, in order to publish their work, students must make considerable adjustments in structure and extension. In this context, it is suggested that event organizers require that papers be presented in the traditional format of a scientific article from the start, allowing for a faster publication process. Similarly, it is necessary to make it clear to the students that each journal has its own standards, so they will always have to make adjustments to their works until they are published, although these will be minimal if, from the beginning, they write their results in the classic format of a scientific article.

This is relevant in the sense that, although it is known that the EPIC standards did not favor the publication of the works carried out by students, the current methodology proposed by Artiles-Visbal *et al.*<sup>22</sup> further complicates this process because it is not aimed at undergraduate students, considering that some of the aspects it addresses require some knowledge of scientific research methodology in order to understand them. A fundamental

factor for the low publication of papers submitted by students to congresses and scientific events is that there is no appropriate publication culture.

In the present study, most of the published articles had changes in the authors (n=19; 79.17%), which were primarily of a mixed nature: addition, exclusion, and/or change of order. This figure is slightly higher than that reported in the study by Corrales-Reyes *et al.*,<sup>10</sup> where 60% (n=3) of the papers published in scientific journals had changes in authorship; however, it should be noted that the number of papers analyzed in that study (n=40) was much lower than in the present study, so the number of articles classified as published (n=5) was also much lower than that described in the present study (n=24), which may explain this difference.

Likewise, the results obtained in the present study differ from those of Ramos-Cordero *et al.*,<sup>19</sup> who found that of the 24 published articles, 58.82% had changes of authorship, although in that case the sample studied was also much smaller (n=64). For their part, Díaz-Samada *et al.*<sup>20</sup> reported that all the research works from the Universidad de Ciencias Médicas de Santiago de Cuba presented at national medical student forums between 2015 and 2017 and that had been published had changes in authorship (n=8). These changes can be related to the fact that the regulations of SSA in Cuba allow a maximum of three authors, with few well-justified exceptions.<sup>21,22</sup>

In the present study, no significant association was found between the characteristics of the papers submitted and the frequency of publication. This finding coincides with the evaluation of the papers presented at the 4<sup>th</sup> Ibero-American Meeting of Dental Students made by Corrales-Reyes *et al.*<sup>10</sup> although the results of that study could be influenced by the small sample of papers (n=40) and the low frequency of publication (n=5).

However, similar studies conducted in Latin America have described associations between characteristics of the papers and their publication, such as that of Toro-Polo *et al.*<sup>7</sup> and Valladares-Garrido *et al.*,<sup>8</sup> who reported that the university of origin of the authors (RR: 5.18; 95%CI:2.3-11.6) and collaborative authorship between two centers (RR: 3.64; 95%CI:1.1-11.7) were associated with the publication of the papers, and that the presence of a research advisor increased the frequency of publication (aPR: 3.18; 95%CI: 1.05-9.65; *p*: 0.041), respectively. Also, in Cuba, according to Corrales-Reyes *et al.*,<sup>11</sup> in the papers presented at the national medical student forums, addressing topics related to oral medicine (PR: 6.59; 95%CI: 1.58-27.5; *p*=0.010) and surgical sciences (PR: 4.52; 95% CI: 1.03-19.8; *p*=0.045) were factors associated with a higher frequency of publication.

It should be noted that, in the present study, research whose first author was from a nursing program was more frequently published than research whose first author was a medical student (cPR: 16.10; 95%CI: 8.35-31.03; *p*<0.001); yet none of the reviewed studies<sup>7,8,10,11</sup> compared the degrees of the first authors or evaluated only events involving students of a certain program (medicine or oral medicine), making this comparison impossible.

The limitations of the present study include the fact that 87 papers had to be excluded because they did not include all the study variables, preventing the analysis of all the papers presented at the events, and that the reasons that could lead the authors not to publish their findings were not determined, an aspect that should be evaluated in future studies to propose possible solutions to the low frequency of publication in this population. Moreover, further studies should extend the time span between the presentation of the works at the events and their publication in scientific journals to determine whether or not there is a possible obsolescence in the publication of this type of works after three or more years have elapsed since they were carried out.

The present research is the first to evaluate the papers presented in a student event in Cuba other than national medical student forums and, given that the Medintávila events

have a wide representation of students in the country, the data reported here confirm the hypothesis of low scientific publication in medical students in the country and allow for an approach to this problem.

## Conclusions

The publication in scientific journals of the papers presented in both editions of the Medintávila event is very low and no factors associated with their scientific publication were identified. Cuban universities need to provide more research support to health science students by developing strategies that encourage and promote the publication of their papers in national and international scientific journals. It is also recommended that the organizers of this type of events request the submission of the research in the form of a scientific article to facilitate the publication process.

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