

Importance of students congresses for medical training: A pioneer experience at Federal University of Rio de Janeiro

Importância dos congressos estudantis para a formação médica: Uma experiência pioneira na Universidade Federal do Rio de Janeiro

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Resumo: O Congresso Acadêmico de Medicina da Universidade Federal do Rio de Janeiro (COAME-UFRJ) promove atividades teórico-práticas e apresentações de trabalhos científicos, dirigido especialmente a estudantes de medicina. Seu público está se expandindo para escolas médicas em todo o país. Apesar de sua relevância, a literatura carece de estudos que avaliem a influência dos eventos acadêmico-científicos na formação dos participantes. O objetivo deste estudo transversal foi compreender a percepção dos alunos do COAME-UFRJ para levantar hipóteses sobre seus benefícios para a formação dos futuros médicos. Os autores distribuíram questionários aos participantes (n=87), contendo 28 questões sobre sua relação com o congresso, envolvimento em projetos de pesquisa, em atividades extracurriculares e sua opinião sobre a experiência adquirida durante o evento. A maioria dos participantes são alunos do ciclo básico e clínico externos à UFRJ. 86,2% consideraram a participação neste tipo de evento "muito importante". Os principais benefícios mencionados foram a aquisição de conhecimentos relevantes para a prática profissional, o aumento do interesse por alguma área da medicina e a motivação para o exercício de atividades extracurriculares em geral e para a participação em eventos semelhantes no futuro. Esses resultados positivos parecem estar associados tanto a fatores circunstanciais como interesses individuais, como ano da graduação, universidade de origem, perspectiva de seguir carreira científica e compreensão pessoal da relevância das atividades acadêmico-científicas. Nossos resultados sugerem que os congressos acadêmicos como o COAME-UFRJ têm potencial para contribuir positivamente na formação dos estudantes de medicina. Mais estudos são necessários, no entanto, para confirmar e melhor compreender a extensão desse benefício.

Palavras-chave: Educação Médica; Workshops; Eventos Científicos e Educacionais; Cursos de treinamento; Motivação.

Abstract: Academic Congress of Medicine of Federal University of Rio de Janeiro (COAME-UFRJ) promotes practical-theoretical activities and presentations of scientific works, aimed especially at medical students. Its audience is expanding toward medical schools in whole country. Despite its relevance, the literature lacks studies evaluating the influence of academic-scientific events for their participants' career building. The objectives of this quantitative, cross-sectional study were to understand the perception of students attending COAME-UFRJ to raise hypotheses about its benefits for medical students' training. Authors handed out questionnaires to all participants (n=87), containing 28 questions regarding their relation with the congress, involvement in research projects, in extracurricular activities, and their opinion on the experience acquired along the event. Most participants are pre-clinical and clinical students external to UFRJ. 86.2% consider participation in this type of event to be 'very important'. The main benefits mentioned were the acquisition of relevant knowledge for professional practice, increased interest in some area of medicine, and motivation to engage in extracurricular activities in general and to attend to similar events in future. These positive outcomes seem to be associated with circumstantial factors, as well as individual interests, such as year of studies, University of origin, prospect of pursuing scientific career and personal understanding of the relevance of academic-scientific activities. Our results suggest that students' congress as COAME-UFRJ have the potential to contribute positively to medical students' training. Further studies are needed, however, to confirm and better understand the extent of this benefit.

Key-words: Medical Education; Workshops; Scientific and Educational Events; Training Courses; Motivation

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INTRODUCTION

The number of Medical Schools in fully activity in Brazil has been quickly growing for the last decades. The high competition in the job market seems to influence the quality of Medical Education and to increase the dedication of medical students for building their résumés (FRAKER, 1998; DONELAN et al 1997; BARZANSKY et al 2005; NAVARRO et al 2011). We notice that the process of acquiring knowledge and skills during graduation grows in complexity, but this event has not been followed as fast by the curriculum that is established by the most traditional Universities, maybe due to bureaucratic or structural issues (NAVARRO et al 2011; CHEHUEN NETO et al 2013; YENGO-KAHN et al 2017).

It has been gaining importance the so-called 'informal curriculum', which is defined by student's self-management and comprehends participating in optional internships and volunteering (CHEHUEN NETO et al 2013; NIU et al. 2012; COSTA et al 2012). It is rising the number of Academic Leagues (AL): local entities associated to a specific subject or medical specialty that offers lectures, debates, round tables, seminars and symposiums, allowing students to be protagonists in the process of building their own learning (TORRES et al 2008), as well as agents for health promotion and social transformation, broadening the object of the medical practice (TORRES et al 2008; TAVARES et al 2007). It is already well-known that becoming an AL member has been an important part of the training for many Brazilian medical students, whose expectations are not met by the contents of the formal curriculum. Moreover, taking part in local student associations, named Academic Centers (AC), monitoring and extension programs, athletic or cultural associations, learning communities, collectives and other extracurricular activities (EA) may fulfill the purposes of filling the gaps observed in the course and enhancing the *Curriculum Vitae* (CV), of relating with peers and meeting the needs of their own career (NIU et al. 2012; COSTA et al 2012; RESENDE et al 2013; SMITH et al 2014; VERONESI et al 2012). The students involved in EA have also, as motivation, an urgent need to live the medical routine, to define themselves professionally and, in some cases, financial issues (NAVARRO et al 2011; CHEHUEN NETO et al 2013; TAVARES et al 2007; SMITH et al 2014).

Another possibility is to participate in RP as undergraduate students. Research gives students experience, builds critical thinking, creates habit and culture of investigation (RESENDE et al 2013). Updating continuously is a requirement for medical professionals and this conduct must be encouraged early, in the faculty (RESENDE et al 2013; QUISPE-JULI et al 2018). On another hand, managing free time, due to long and tiresome working hours, have been pointed out as a huge obstacle to students' engagement in research. It may also be a reason for quitting any kind of EA (TORRES et al 2008; TAVARES et al 2007; QUISPE-JULI et al 2018; PERES et al 2007).

Finally, it is necessary to mention students' representative boards, both national and internationally, like DENEM (the National Executive Board of Medical Students) and IFMSA Brazil (International Federation of Medical Students' Associations), which present axels of planning that aim Medical Education and organize congresses such as COBREM and COBHAM, respectively. Besides, major events such as COMU (University Medical Congress, organized by students of *São Paulo University*) were born, which incorporates formative activities about themes that usually attract students. These events add value to scientific production and represent a place where students can build networks, develop studies in cooperation and discuss learning methodologies (SILVA et al 2012).

Following this path, in 2017, the first *Congresso Acadêmico de Medicina da Universidade Federal do Rio de Janeiro* (COAME-UFRJ) was held, a project conceived for stimulating publications and applied knowledge. Progressive incorporation of workshops has also contributed for its participants' practical learning, as these activities are considered outdated in the regular subjects (CHEHUEN NETO et al 2013; COSTA et al 2012; TAVARES et al 2007). In 2019, in its third edition, COAME-UFRJ involved 223 people, including participants, organizers, monitors and professors.

Although there is a growing number of student congresses in general, the literature still lacks studies evaluating the aspirations and opinions of the public who attend these events and, above all, their relevance for the formation of medical students.

Therefore, this study has the aim to recognize the profile of the participants of III COAME-UFRJ, register their opinions about the congress and skills acquired during the event, as well as collect data about non mandatory activities in which these students are engaged. Thus, our intention is to identify the target public of COAME-UFRJ and improve its proposals for future editions. Finally, hypotheses were raised about the benefits of this kind of congress as theoretical support to make it grow and spread to other Universities, and, as a higher goal, to contribute to a holistic formation of medical students.

METHODS

Study and participants

This study is a quantitative, cross-sectional survey, which involves medical students that attended III COAME-UFRJ, taking part in workshops and/or presenting scientific works during the event. Questionnaires were handed out physically or virtually (online) to all participants after the event.

Instruments

The questionnaire used in the study included 28 questions, elaborated by the researchers, referring to five main categories:

- **Participants' profile.** The 3 variables analyzed were: University attended, the period the student was in, and if the participant knows which specialty he/she wishes to pursue after medical school;

- **Participant's relation with COAME-UFRJ.** The 7 variables analyzed were: if the participant attended previous event editions, how he/she gathered information about it, evaluation of the event in terms of global quality, evaluation of the Organizing Committee, opinion about the relevance of similar academic-scientific events, opinion on when, during medical school, students would better start attending this kind of event, as well as if the student is interested in participating in and/or coordinating similar events in future editions;

- **Opinion about knowledge and skills acquired in COAME-UFRJ.** Through 7 agree/disagree questions, the study tried to analyze: if participants believe that the experience acquired will be helpful for their practice as medical doctors, if they are connected to their specialty of interest, if the activities raised interest on new areas in medicine, if they feel more motivated to look for a research project, extension project or even to apply for another scientific event, or if the experience raised their confidence to present a work at a congress;

- **Participants' involvement in research projects.** The 5 variables analyzed were: if the participant is currently involved in any project, if he/she has been enrolled in any project during medical school, how long he/she has been enrolled in the project, his/her main motivation to get involved in research, or, if applicable, no to get involved in research;

- **Participants' enrollment in extracurricular activities.** The 6 variables analyzed referred to: type of activity performed (AL, AC, music, sports, monitoring, extension projects, others), motivation to get involved or not in the activity and time spent weekly in these activities.

Statistics Analysis

The questionnaires filled up by the participants were digitized and analyzed statistically using the software *IBM SPSS Statistics® Version 25*. Independent tests *t*-

Student and *One-Way ANOVA* were used to compare averages and quantitative variables, such as grade given to the event and phase of studies; and the Pearson chi-square test of independence (χ^2), to verify the association between nominal qualitative variables. A level of statistics significance of 95% ($p < 0,05$) was admitted.

Ethical Approval

The project was submitted and approved by the Research Ethics Committee of *Instituto de Pediatria e Puericultura Martagão Gesteira* (IPPMG - UFRJ), with Certificate of Presentation for Ethical Appreciation (CAAE) under the registration number 84589418.5.0000.5143 at *Plataforma Brasil*.

RESULTS

Participants' distribution according to phase of studies and University of origin

A total of 106 participants attended III COAME-UFRJ, 97 of whom filled in the questionnaire as well as the consent form. Finally, 87 valid questionnaires were obtained, excluding mistakes during filling procedure and participants who did not identify themselves as medical students.

42 (42.5%) out of the 87 participants are students at UFRJ campus *Cidade Universitária* (UFRJ-CDU). The remaining participants (55.8%) come from other universities and are referred along the text as visitors (see **Supplementary Table 1**).

The participants were also ranked according to their phase of studies, within the medical school years, by the time of the event. A semester represents a 'period'. First to fourth period students are considered pre-clinical and composed 44,8% of our public ($n=39$); fifth to eighth period students, clinical ones (36,8%, $n=32$); and ninth to twelfth period students, interns or internship students (18,4%, $n=16$).

We observed that most of the participants from UFRJ-CDU were pre-clinical students (56,8%, $n=21$), while there was a higher proportion of clinical students amongst visitors (50,0%, $n=25$) [$\chi^2_{(2)}=8,86$, $p=0,01$] (**Figure 1**).



Figure 1: Profile of the participants and their opinion on III COAME-UFRJ ('Total'). Data was crossed with University of origin. p-value refers to chi-square test.

| | | University | | | | | | χ^2 | p-value |
|--|-----------------------|----------------|-------|----------------|-------|-------------------|--------|----------|---------|
| | | Total | | UFRJ-CDU | | Others (Visitors) | | | |
| | | N ^o | % | N ^o | % | N ^o | % | | |
| Phase of studies | Preclinical (1st-4th) | 39 | 44,8% | 21 | 56,8% | 18 | 36,0% | 8,861 | 0,012 |
| | Clinical (5th-8th) | 32 | 36,8% | 7 | 18,9% | 25 | 50,0% | | |
| | Internship (9th-12th) | 16 | 18,4% | 9 | 24,3% | 7 | 14,0% | | |
| Previous COAME? | No | 80 | 91,9% | 30 | 81,1% | 50 | 100,0% | 10,29 | 0,0013 |
| | Yes | 7 | 8,1% | 7 | 18,9% | 0 | 0,0% | | |
| Evaluation of COAME | 5 and 6 | 3 | 3,4% | 2 | 5,4% | 1 | 2,0% | 0,78 | 0,68 |
| | 7 and 8 | 23 | 26,4% | 10 | 27,0% | 13 | 26,0% | | |
| | 9 and 10 | 61 | 70,1% | 25 | 67,6% | 36 | 72,0% | | |
| Evaluation of the Organizing Committee | 5 and 6 | 3 | 3,4% | 3 | 8,1% | 0 | 0,0% | 4,2 | 0,12 |
| | 7 and 8 | 15 | 17,2% | 6 | 16,2% | 9 | 18,0% | | |
| | 9 and 10 | 69 | 79,3% | 28 | 75,7% | 41 | 82,0% | | |
| Relevance of similar events | Of little Importance | 0 | 0,0% | 0 | 0,0% | 0 | 0,0% | 6 | 0,014 |
| | Important | 12 | 13,8% | 9 | 24,3% | 3 | 6,0% | | |
| | Very Important | 75 | 86,2% | 28 | 75,7% | 47 | 94,0% | | |
| Interest in taking part again? | No | 2 | 2,3% | 1 | 2,7% | 1 | 2,0% | 0,047 | 0,829 |
| | Yes | 85 | 97,7% | 36 | 97,3% | 49 | 98,0% | | |
| Interest in coordinating? | No | 24 | 27,6% | 13 | 35,1% | 11 | 22,0% | 1,83 | 0,175 |
| | Yes | 63 | 72,4% | 24 | 64,9% | 39 | 78,0% | | |
| When to start | Preclinical | 70 | 80,5% | 30 | 81,1% | 40 | 80,0% | 0,016 | 0,899 |
| | Clinical | 17 | 19,5% | 7 | 18,9% | 10 | 20,0% | | |
| | Internship | 0 | 0,0% | 0 | 0,0% | 0 | 0,0% | | |

Participants' opinion about III COAME-UFRJ and similar events

Average grades given to the congress and Organizing Committee were 9.08 (CI95%=8,82-9,34) and 9.24 (CI95%=8,99-9,49) respectively, ranging from 1 to 10. There were no grades below 5. UFRJ-CDU students tended to attribute lower grades to the congress [9.0(.20)] and Committee [9.08(.23)] when compared to visitors [9.15(.17) and 9.36(.14)], respectively). This difference, however, was not statistically significant [*t-test*=4.2; *p*=0.12]. Besides, we observed that interns tended to give lower grades to the event (8.75, CI95%=8,12-9,38) and to the Organizing Committee (9.0, CI95%=8,42-9,58).

90.9% (n=80) of the participants attended COAME-UFRJ for the first time. All of the students present in at least one previous edition came from UFRJ-CDU, while the majority of the newcomers are visitors [$\chi^2_{(2)}=10.29$; *p*=0.001] (Figure 1).

When asked about reasons not to attend prior editions, participants mentioned mostly lack of previous information about the congress, mainly among visitors

(66.0%, n=33). Lack of interest was clearly mentioned mostly by UFRJ-CDU students [16.2% (n=6), against 2.0% (n=1) among visitors] [$\chi^2_{(2)}=34.42$, *p*<0.001]. Other reasons can be found in **Supplementary Table 2**.

Regarding the current edition of the congress, the participants referred as its main source of information the social medias (52.9%, n=46) and invitation from colleagues (36.8%, n=32). Only 4.6% (n=4) mentioned invitation from a professor, and 3.4% (n=3) got first information from posters and brochures. When sorted out by University of origin, UFRJ-CDU students gathered information mostly from social medias, while visitors mentioned, as main reason, invitations from colleagues (**Supplementary Table 2**).

86.2% (n=75) of the participants considered 'very important' for medical students to attend academic-scientific events such as COAME-UFRJ. This proportion was significantly higher among visitors (94.0%, n=47) [$\chi^2_{(2)}=6.00$; *p*=0.01] and lower among interns (62.5%, n=10) [$\chi^2_{(2)}=9.5$; *p*=0.009]. Nobody answered 'of little importance' (Figures 1 and 2).

Figure 2: Correlation between the phase of medical studies and participants' opinion about III COAME-UFRJ. p-value refers to chi-square test.

| | | Phase of medical studies | | | | | | χ^2 | p-value |
|---|-----------------------|--------------------------|--------|----------|--------|------------|--------|----------|---------|
| | | Preclinical | | Clinical | | Internship | | | |
| | | Nº | % | Nº | % | Nº | % | | |
| Previous COAME? | No | 37 | 94,87% | 30 | 93,75% | 13 | 86,67% | 3,066 | 0,21 |
| | Yes | 2 | 5,13% | 2 | 6,25% | 2 | 13,33% | | |
| Evaluation of COAME | 5 and 6 | 1 | 2,60% | 2 | 6,30% | 0 | 0,00% | 4,154 | 0,385 |
| | 7 and 8 | 9 | 23,10% | 7 | 21,90% | 7 | 43,80% | | |
| | 9 and 10 | 29 | 74,40% | 23 | 71,90% | 9 | 56,30% | | |
| Evaluation of the Organizing Committee | 5 and 6 | 2 | 5,10% | 1 | 3,10% | 0 | 0,00% | 3,525 | 0,474 |
| | 7 and 8 | 6 | 15,40% | 4 | 12,50% | 5 | 31,30% | | |
| | 9 and 10 | 31 | 79,50% | 27 | 84,40% | 11 | 68,80% | | |
| Relevance of similar events | Important | 4 | 10,3% | 2 | 6,3% | 6 | 37,5% | 9,5 | 0,009 |
| | Very Important | 35 | 89,7% | 30 | 93,8% | 10 | 62,5% | | |
| Interest in taking part again? | No | 0 | 0,0% | 2 | 6,3% | 0 | 0,0% | 3,52 | 0,17 |
| | Yes | 39 | 100,0% | 30 | 93,8% | 16 | 100,0% | | |
| Interest in coordinating? | No | 13 | 33,30% | 5 | 15,60% | 6 | 37,50% | 3,93 | 0,155 |
| | Yes | 26 | 66,70% | 27 | 84,40% | 10 | 62,50% | | |
| When to start | Preclinical | 38 | 97,40% | 24 | 75,00% | 8 | 50,00% | 17,2 | 0,0002 |
| | Clinical | 1 | 2,6% | 8 | 25,0% | 8 | 50,0% | | |
| | Internship | 0 | 0,0% | 0 | 0,0% | 0 | 0,0% | | |

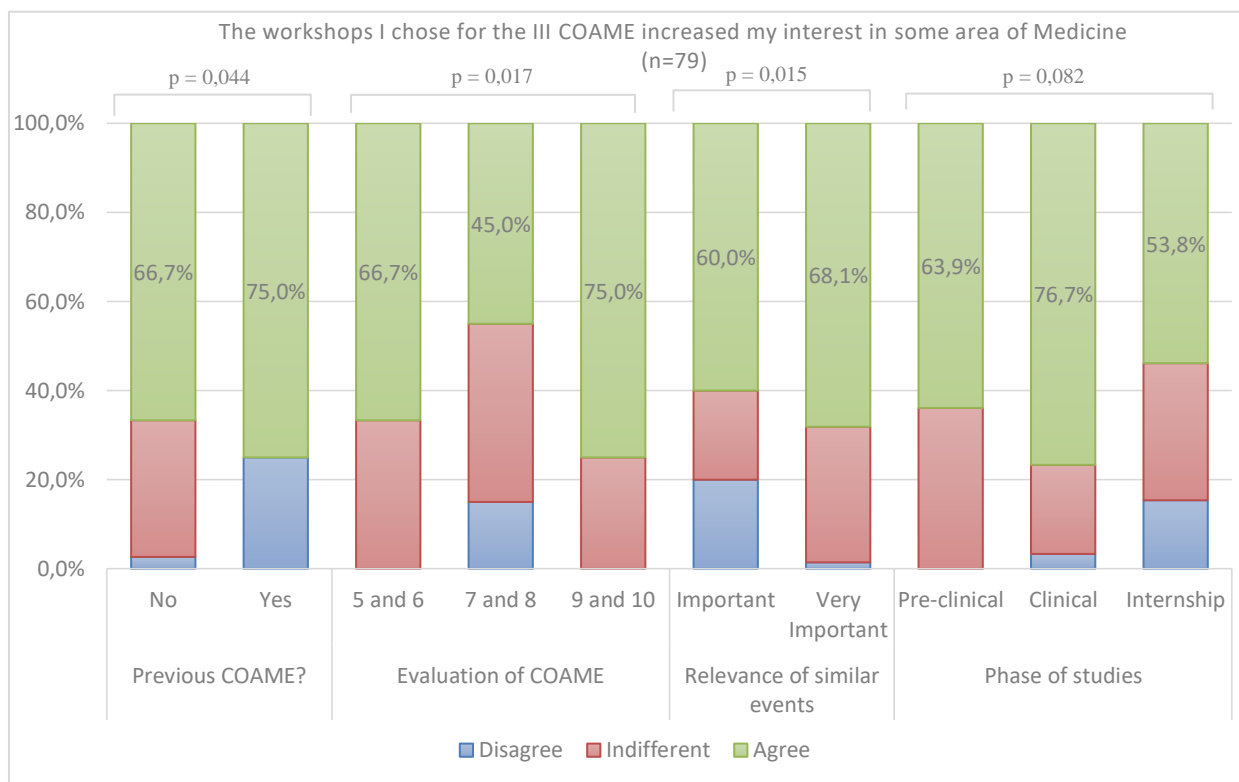
Only 2 respondents (2.3%) showed no interest in attending COAME-UFRJ again. 72.4% (n=63) showed interest in coordinating future editions of the event. This proportion tends to rise among visitors (78.0%, n=39) [$\chi^2_{(2)}=1.83$; p=0.17], as well as among clinical students (84.4%, n=27) [$\chi^2_{(2)}=3.93$; p=0.15] (**Figures 1 and 2**). Individuals that consider 'very important' for medical students to participate in academic-scientific events also demonstrated, in a significantly higher proportion, interest in coordinating future editions of COAME-UFRJ (77.3%, n=58) [$\chi^2_{(2)}=0.27$; p=0.01]. (**Supplementary Graphic 1**).

80.5% (n=70) of the participants recommended that medical students get involved in events such as COAME-UFRJ since pre-clinical years. Nobody recommended waiting until internship. University of origin does not seem to affect this opinion (**Figure 1**). However, among interns, only half (50%, n=8) of the respondents recommended early involvement in scientific-academic events, compared to 75.0% (n=24) of clinical students and 97.4% (n=38) of pre-clinical ones [$\chi^2_{(2)}=17.20$; p<0.001] (**Figure 2**).

Participants' perceptions on the knowledge acquired during III COAME-UFRJ

Considering the 79 students enrolled in workshops, 77 (97.4%) agreed that, during the event, they acquired important experience and knowledge for professional practice, despite their current phase of studies. 67.0% (n=53) of the students attending workshops mentioned that these activities raised their interest for a specific area of medicine, proportion that decreases among interns (53.8%, n=7) [$\chi^2_{(2)}=8.25$; p=0.08] and rises among participants that considered 'very important' to get involved in events such as COAME-UFRJ (68.1%, n=47) [$\chi^2_{(2)}=8.327$; p=0.01]. Still, the participants who agreed with this same assertive clearly gave higher grades to COAME-UFRJ [$\chi^2_{(2)}=11.98$; p=0.02] (**Figure 3 and Supplementary Table 3**).

Figure 3: Correlation between participants' responses to the statement 'The workshops I chose for III COAME-UFRJ raised my interest for a specific area of medicine and: attendance to previous editions of the congress'; grade given to the congress; opinion about the relevance of this type of event; and current phase of studies at medical school. We considered here the 79 participants of III COAME-UFRJ enrolled in workshops exclusively. p-value refers to chi-square test.



Only 44.3% (n=34) of the participants enrolled in workshops have chosen the activities according to specialty of interest – that is, 76.9% (n=10) among interns, 50.0% (n=15) among clinical and 27.8% (n=10) among pre-clinical students [$\chi^2_{(2)}=14.02$; $p<0.01$]. This proportion also rises among visitors compared to UFRJ-CDU students [$\chi^2_{(2)}=9.77$; $p<0.01$] (**Supplementary Graphic 2**).

27.6% (n=24) of all participants have decided the medical residency they intend to pursue, ranging between 20.5% (n=8) (pre-clinical students) and 50.0% (n=8) (interns) [$\chi^2_{(2)}=6.737$; $p=0.15$]. University of origin does not seem to influence this result. Additionally, participants of prior editions of COAME-UFRJ demonstrated, in a higher proportion, certainty about medical residency to pursue (57.1%, n=4) [$\chi^2_{(2)}=10.75$; $p<0.01$].

86.2% (n=75) of the participants feel more motivated to attend others scientific events after III COAME-UFRJ, proportion that rises among visitors (94.0%, n=47) [$\chi^2_{(2)}=6.28$; $p=0.04$] and among pre-clinical students (92.3%, n=36) [$\chi^2_{(2)}=3.00$; $p=0.22$], although in the last group we couldn't find a statistically significant association. 78.2% (n=68) also feel more motivated to get involved in EA generally, such as in extension projects or students' organizations. This number was higher among the students who classified events similar to COAME-UFRJ as 'very important' [$\chi^2_{(2)}=6.87$; $p=0.03$]

(**Supplementary Table 4**). It has not been observed any difference between visitors and non-visitors.

59.8% (n=52) of the participants feel more motivated to get enrolled in RP after III COAME-UFRJ, proportion that tends to increase among visitors [$\chi^2_{(2)}=5.13$; $p=0.08$].

Finally, 46.0% (n=40) of the participants agree that they feel more confident to present works in congresses and other scientific events; this information is highly associated to the belief that attending events similar to COAME-UFRJ is 'very important' [$\chi^2_{(2)}=14.33$; $p<0.01$] (**Supplementary Table 4**).

Participants' involvement in research projects (RP)

41.4% (n=36) of the participants are currently involved in a RP, only 8% (n=7) of whom receive some financial aid or scholarship. Only one student (1.1%) is pursuing a MD-PhD degree, program established by brazilian public institutions such as UFRJ that allows concomitance between undergraduate and PhD activities in medicine (OLIVEIRA et al 2009). Most of the students currently involved in a project have done so for less than 1 year. (**Supplementary Table 5**)

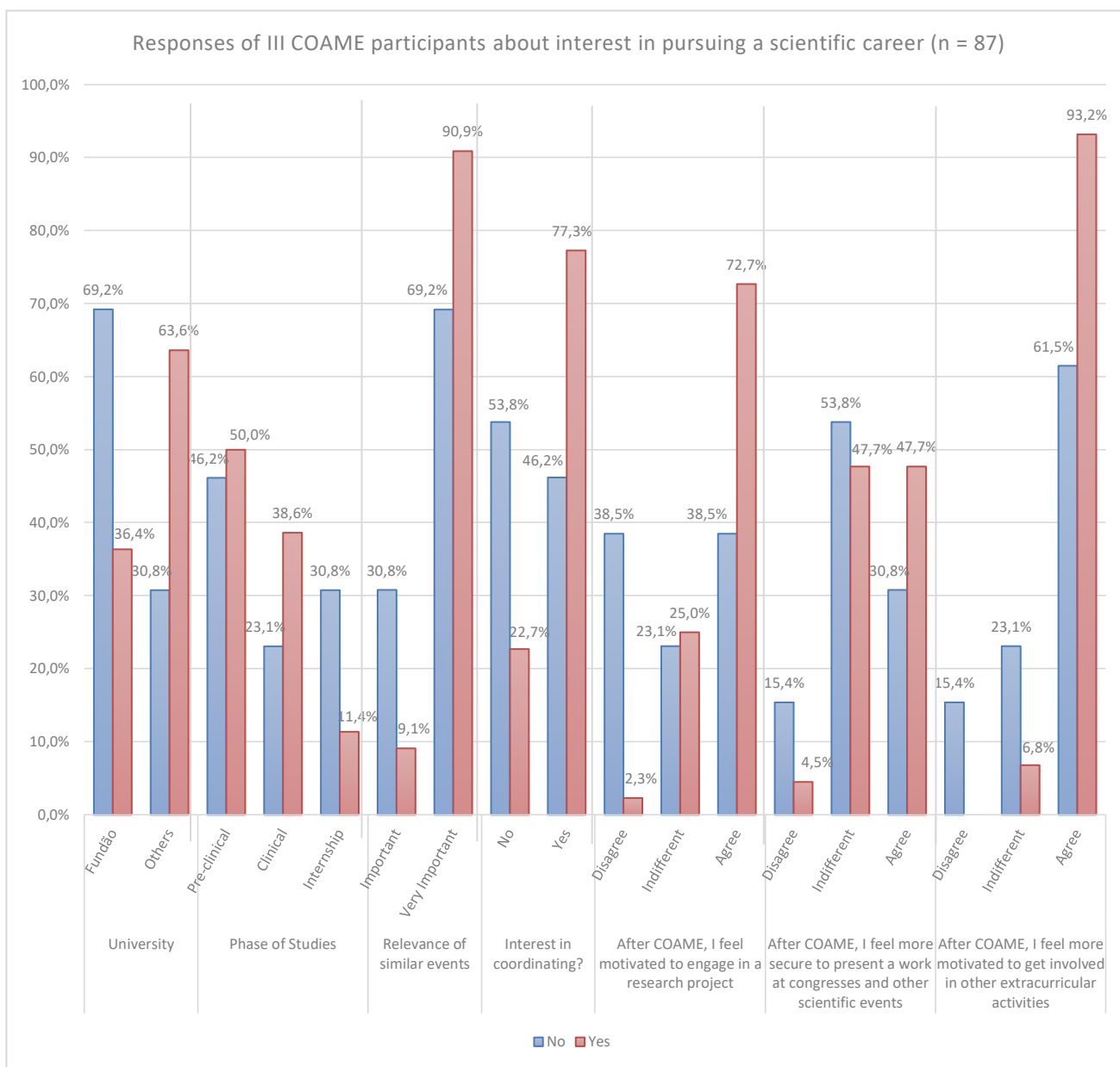
Participation in a RP does not seem to be associated with University of origin, but we observed that clinical students are more likely to be involved in research [50.0%

(n=18) up to 71.4% (n=5) in the subgroup of scholarship holders) [$\chi^2_{(2)}=14.17$; p=0.08]. (**Supplementary Table 6**).

57.1% (n=4) of the students who attended prior editions of COAME-UFRJ take part in research, against 40.2% (n=32) of the newcomers [$\chi^2_{(2)}=12.68$; p=0.01]. 58.3% (n=21) of all participants enrolled in projects feel more confident to present works in events after III COAME-UFRJ, proportion that rises among scholarships holders (85.7%, n=6) [$\chi^2_{(2)}=28.09$; p<0.01]. On the other hand, 58.0% (n=29) of the participants not enrolled in projects wish to seek an opportunity in research after III COAME-UFRJ, and 84.0% (n=42) feel more motivated to seek other EA (**Supplementary Table 6**).

50.6% (n=44) of the participants showed interest in pursuing a scientific career (**Supplementary Table 5**), the majority of them (63.6%, n=28) being visitors. Most of the students interested in a scientific career consider 'very important' to attend events like COAME-UFRJ (90.9%, n=40) and wish to coordinate future editions of the congress (77.3%, n=34). That subgroup of students also shows higher motivation to engage in RP after COAME-UFRJ [$\chi^2_{(2)}=16.99$; p<0.01] and in EA generally [$\chi^2_{(2)}=12.97$; p=0.01] (**Figure 4 and Supplementary Table 7**).

Figure 4: Correlation between interest in taking up a scientific career and: University of origin, phase of medical studies, topics regarding the relation of the participant with III COAME-UFRJ and answer to statements about motivation after the event.



38.0% (n=19) of the participants currently not enrolled in RP refer some previous involvement during medical school, proportion that rises among UFRJ-CDU students (59.1%, n=13). For the ones never engaged in research, the main reasons mentioned were lack of projects available for undergraduates (26.3%, n=10) and lack of information (23.7%, n=9). These proportions are higher among visitors [37.5% (n=9) and 29.2% (n=7), respectively] [$\chi^2_{(5)}=10.89$; $p=0.05$] (**Supplementary Graphic 3**). Additionally, 62.1% (n=18) of the students never engaged in RP show motivation for finding a project after the congress; and 96.6% (n=28), for attending other scientific events like III COAME-UFRJ.

The students currently or previously engaged in a RP have mentioned as main reason to do so a wish for recognition / enhancing the résumé (64.3%, n=36) and for contributing to science (57.1%, n=32) (**Supplementary Table 8**). Those students have given better grades do the Organizing Committee (9.62, CI95%=9.34-9.91, t-test=-2.83; $p<0.01$) and, although not statistically significant, to COAME-UFRJ (9.25, CI95%=8.86-9.64, t-test=-1.06; $p=0.29$) (**Supplementary Graphic 4**).

Participants' involvement in other extracurricular activities (EA)

60.0% (n=51) of the participants mentioned current or previous engagement in some EA such as AL (55.3%, n=47), AC (7.1%, n=6), musical or culture-related entities (4.7%, n=4) and sportive associations (5.9%, n=5). Among clinical students, that engagement is significantly higher (78.1%, n=25) [$\chi^2_{(2)}=7.03$; $p=0.03$], as well as among visitors (66.0%, n=33) [$\chi^2_{(2)}=1.81$; $p=0.18$] (**Supplementary Graphic 5**).

The main reasons to participate in EA mentioned were to obtain acknowledgement and enrich the CV (64.6%, n=31), contribute for colleagues' medical training (47.9%, n=23) and build network (25.0%, n=12) (**Supplementary Table 9**).

84.9% (n=45) of the participants involved in EA dedicate less than 8 weekly hours to these activities, what

does not seem to be associated either with phase of studies [$\chi^2_{(2)}=7.16$; $p=0.13$] or with University of origin [$\chi^2_{(2)}=1.27$; $p=0.53$].

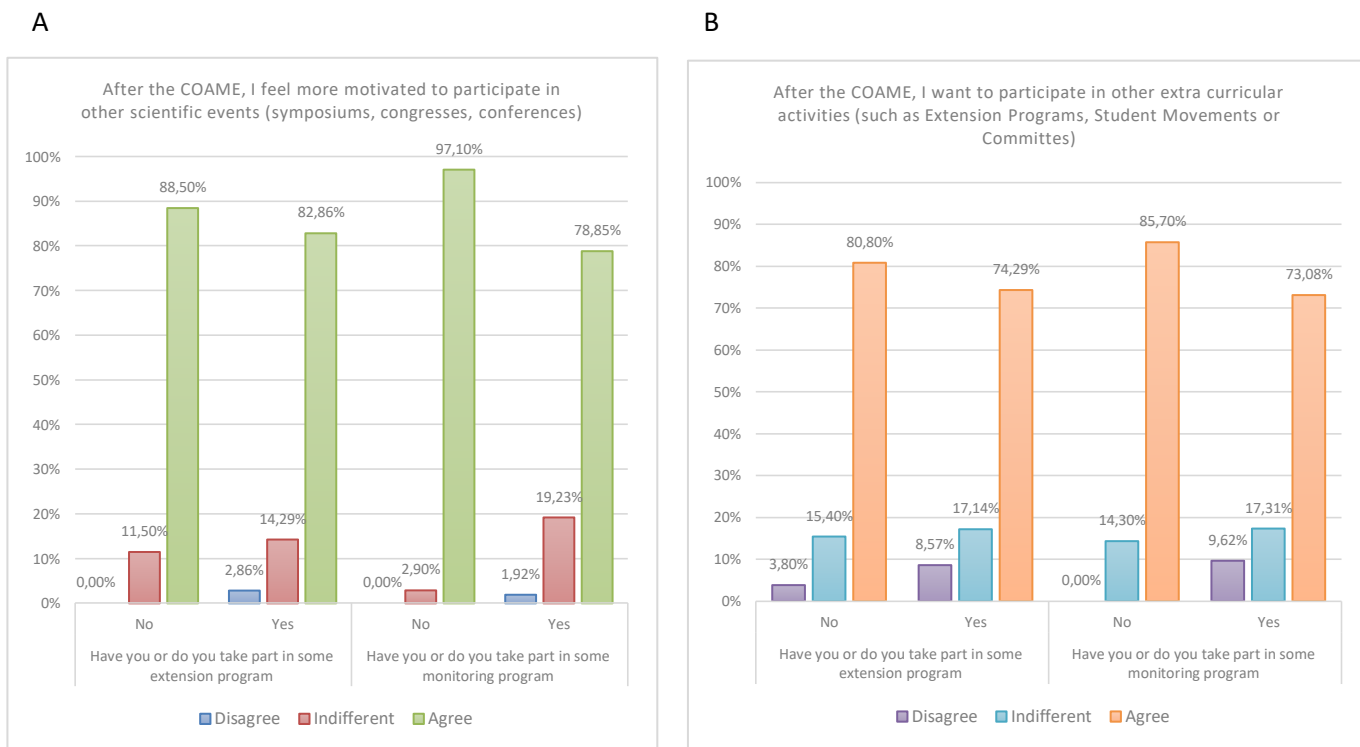
As for participants not involved in EA, lack of interest was mentioned as main reason by 44.1% (n=15) of them, being 69.8% (n=11) among UFRJ-CDU students and 23.5% (n=4) among visitors. (**Supplementary Table 10**). These students, who mentioned lack of interest, tended to attribute lower grades to COAME-UFRJ [8.8(0.40)] when compared to those who mentioned lack of time or few opportunities of activities offered by the University [9.2(0.37)] [*One-Way ANOVA*, $Z=1.61$; $p=0.17$].

80.0% (n=68) of all participants reported a greater interest in performing an EA after III COAME-UFRJ, although not statistically significant, this number tends to be higher among those who do not currently participate in any activity (91.2%, n=31) [$\chi^2_{(2)}=4.44$; $p=0.11$]. Moreover, those students not involved in EA also mentioned, in higher proportion, that they feel more motivated to attend scientific events after III COAME-UFRJ [$\chi^2_{(2)}=12.48$; $p=0.01$] (**Supplementary Graphic 8**).

35.6% (n=31) of the participants mentioned current involvement in extension projects, while other 4.6% (n=4) mentioned previous involvement during medical school. Only 6.9% (n=6) earn scholarship for this activity (**Supplementary Table 11**). Students involved in extension projects show more motivation to attend scientific events after III COAME-UFRJ [$\chi^2_{(2)}=14.48$; $p=0.02$] (**Figure 5A**) and to engage in other EA [$\chi^2_{(2)}=11.91$; $p=0.06$] (**Figure 5B**).

Finally, 51.7% (n=45) of the participants mention current or previous involvement in monitoring programs, comprehending scholarship holders (16.1%, n=14) and volunteers (**Supplementary Table 11**). Among those never involved in monitoring, 97.1% (n=34) feel more motivated to attend scientific events after III COAME-UFRJ [$\chi^2_{(2)}=30.52$; $p<0.01$] (**Figure 5A**). Furthermore, students not involved in EA tend to show motivation for seeking similar activities after the event [$\chi^2_{(2)}=11.99$; $p=0.06$] (**Figure 5B**).

Figure 5: Correlation between participation in extension and monitoring programs and motivation to participate, after III COAME-UFRJ, in scientific events (A), as well as in other EA (B).



DISCUSSION

Student congresses are relatively new events in the university context and, with only three years of existence, COAME-UFRJ has been achieving recognition edition by edition, not only within Federal University of Rio de Janeiro, as well as in other Higher Education Institutions (HEI). All its organizers are medical students at UFRJ-CDU, who have made efforts to promote the event in students' communities regionally and nationally. Also, due to its unique profile in the history of UFRJ, COAME-UFRJ has been receiving an increasing number of participants and, as our results suggest, a higher proportion of come from other HEI.

This perception is reinforced by the fact that the participants who attended previous editions are students from UFRJ exclusively, while visitors count as an important portion of the newcomers – most of whom had no knowledge of the existence of the first and second COAME-UFRJ events. The outside participants, as we observe, presented a relation to the congress which is especially positive, suggesting that the Organizing Committee has succeeded in expanding the target public of COAME-UFRJ through the years.

Bearing in mind that most of the participants mentioned lack of previous information about the event, investing resources in extensive advertising comes out as a promising strategy aiming at making COAME-UFRJ grow. We found evidence that the social medias have as huge role as a marketing tool. We suppose that, once an important part of this information was spread in virtual groups and internal media of UFRJ, the access by students

from other universities may have been impaired. This seems to be an ongoing challenge: amplifying marketing strategies toward groups and channels external to UFRJ.

There is possibly a bias on the study selection, considering that visitors consider more difficult to access information about the event. We postulate that these students have invested more time and financial resources to attend III COAME-UFRJ. It may, thus, represent a subgroup of medical students who have a special interest in events alike. Our inference is reinforced by the fact that, when asked about reasons not to attend the previous editions of COAME-UFRJ, most visitors mention lack of information, while a higher proportion of UFRJ-CDU students mentioned lack of interest merely.

Still regarding accessibility and financial issues, they may justify the fact that UFRJ-CDU students are mostly pre-clinical, while the visitors tend to show up later, mostly during clinical studies.

The majority of the participants, by the way, is represented by pre-clinical or clinical students, possibly reflecting that older medical students are either less interested in the congress proposals or simply overloaded of activities to perform, making it difficult for them to attend events such as COAME-UFRJ (NAVARRO et al 2011; CHEHUEN NETO et al 2013; NIU et al. 2012; COSTA et al. 2012; TAVARES et al 2007).

This hypothesis is strengthened when we observe the higher relevance given by non-interns to scientific-academic events such as III COAME-UFRJ, as well as the fact that fewer interns recommend that medical students engage in this type of activity since pre-clinical years. These findings suggest that this subgroup of participants

have a more reserved opinion about the role of student congresses in the theoretical-practical training of the future medical doctor. Therefore, we reinforce that the next generations of organizers of COAME-UFRJ should attempt to make its activities more attractive for older students without neglecting the younger ones. We also recommend investments in marketing directed to medical students of each phase separately – interns, clinical and pre-clinical ones.

It is noteworthy the number of participants who affirm interest in coordinating future editions of COAME-UFRJ, once more illustrating the success obtained by the congress and its potential to expand, gathering partners from inside and outside UFRJ.

Also noteworthy is the opinion of workshop attendees about the benefits of these activities for themselves: mostly, they consider that the experience built up their interest in diverse subareas of medicine as well as their expectations about registering for other student congresses. Besides, it enhanced their motivation to seek new RP and other EA. These activities have proven to be relevant for medical students' training (RESENDE et al 2013; SMITH et al 2014; VERONESI et al 2012; QUISPE-JULI et al 2018; PERES et al 2007). Our results suggest that this contribution is particularly significant among students not engaged in RP or EA, what makes them an important target public for COAME-UFRJ in future editions.

On the other hand, participants engaged in RP demonstrate a growing confidence in presenting papers after the event, namely those long involved in a project. These participants had the opportunity to expose their work during the event, and here lies another potential for COAME-UFRJ: introducing medical students to research. Supporting this aim also poses a challenge for future organizers of the congress.

As for the important segment of visitors referring lack of information or opportunities to engage in RP, that is acknowledged as an important limitation to students' involvement in scientific production (RESENDE et al 2013; QUISPE-JULI et al 2018; PERES et al 2007; SÁNCHEZ-MENDIOLA et al 2015). We understand that, for this subgroup, COAME-UFRJ brings an occasion for gathering data about ongoing projects and building network, thus contributing to broaden the medical training.

The association between attending previous editions of COAME-UFRJ and involvement in RP may suggest that the congress affects its participants' decision to seek these activities. We understand that this effect needs to be better investigated in longitudinal studies, comprehending higher number of participants in futures editions of the event.

Our results also suggest the existence of an intimate relation between reasons for seeking RP during medical school and motivation to build formal and informal *curriculum*, similarly to what is found in literature (TAVARES et al 2007; RESENDE et al 2013; QUISPE-JULI et al 2018; PERES et al 2007; SÁNCHEZ-MENDIOLA et al 2015).

Students involved in research demonstrate singular interest in COAME-UFRJ, as well as those who consider pursuing scientific career and those who aim at contributing to science, results which were already expected. Participants who expose their works in the congress run for prizes, are criticized, and may enhance their *curriculum* as means to get highlights in the competitive job market (FRAKER, 1998; DONELAN et al 1997; BARZANSKY et al 2005; NAVARRO et al 2011). This benefit and approach should also be considered by future organizers of COAME-UFRJ.

We also observed that AL are the most common EA held by the participants of III COAME-UFRJ, thus reproducing what the literature points to (CHEHUEN NETO et al 2013; COSTA et al 2012; TORRES et al 2008; TAVARES et al 2007; SMITH et al 2014; PERES et al 2007). Reasons mentioned to participate in AL seem to be related, once more, to individual and group needs: to guarantee a medical training that is not restrict to the formal subjects of medical school.

COAME-UFRJ seems to assume a double-purpose, judging by its participants' profiles: older students tend to choose activities aligned with a specialty of interest already established, while clinical and pre-clinical students demonstrate less specific interests. For interns, possibly, COAME-UFRJ comes up as an opportunity to explore either one or several specific areas of interest. As for less experienced students, they may find in the congress a trigger for career orientation, finding new fields of knowledge, enhancing general abilities and nourishing curiosity for EA, what the literature describes as determining in the choice of a medical specialty (CORSI et al 2014; COSTA et al 2014; WATTE et al 2015; AL-FOUZAN et al 2012; SHE et al 2008; NEWTON et al 2005; BOYD et al, 2009). Indeed, only a minority of participants consider themselves sure about a residency to pursue, proportion that is higher in the subgroup of students who attended previous editions of the congress.

Concerning limitations, we must mention internal issues, of study design, and external ones, inherent to the model of study proposed. Cross-sectional studies fail to set up causality, requiring other works, aiming at scientific-academic congresses, for this purpose. There is also a need to evaluate COAME-UFRJ longitudinally, comparing this edition of the event with upcoming ones, to determine with stronger evidence its contribution to medical training.

Another limitation was the small number of responders in some subgroups analyzed for statistical association. This can and must be solved in future studies on COAME-UFRJ, as we improve advertising, upgrade mechanisms for collecting data and, thus, increase the absolute number of participants of the congress.

CONCLUSION

Our results suggest that III COAME-UFRJ was well rated among the participants. There was an important growth in its target public in 2019, mainly by attracting

students from other HEI. We have observed that not only circumstantial variables, such as the phase of medical studies and University of origin, affect the students perspective of COAME-UFRJ, but also their personal interests, specific and subjective factors of each individual, such as the will of pursuing scientific career, and their opinion about the relevance of academic-scientific activities in general.

Besides, it is known that RP and EA in general have been integrated to medical training and to the routine of the students. Attending COAME-UFRJ seems to be associated to attending these activities, either as a consequence: the event is possibly more attractive and appreciated by students involved in EA; or as a cause: attending COAME may come up as a trigger for the students to embrace new opportunities.

Lastly, we understand the importance of keeping COAME-UFRJ growing and spreading toward other HEI, using cost-effective means that already exist for marketing. There is also a need to make the event more attractive to interns, without neglecting the expectations of younger students. Finally, we expect to consolidate the presence of the congress and that its recognition may serve as light for other medical schools to promote activities alike, as well as for UFRJ to sponsor this valuable experience.

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