

Profile of medical graduates from a higher education institution in Northeastern Brazil

Perfil do egresso médico de uma instituição de ensino superior do Nordeste do Brasil

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ABSTRACT

Introduction: In recent years, there has been an increase in the number of medical schools in Brazil and, concomitantly, the interest in improving the quality of teaching in medicine has increased. One question resulting from this change is whether this increase in medical schools will imply the training of professionals capable of meeting the demands of contemporary society. One way to answer this question is to know the profile of the institutions' graduates.

Objective: To evaluate the profile of medical graduates trained at a higher education institution in northeast Brazil.

Method: A cross-sectional field research study with a quantitative approach was carried out. Graduates of the medical course of a higher education institution, graduated from 2012 to 2019, were evaluated through a questionnaire sent via e-mail, with multiple choice questions. The study was approved by the institution's ethics committee.

Results: A total of 127 questionnaires were analyzed, which corresponds to a response rate of 13.8%; females predominated, representing 67.7% of the sample. Knowledge about the National Curriculum Guidelines during undergraduate school was reported by 24.2% of the participants. Most graduates demonstrated satisfaction with the course taken and a feeling of being prepared for professional work as a generalist. Regarding medical residency, 90.5% of the graduates attended this type of specialization program. Professional performance of graduates in the Family Health Strategy and in the Brazilian Unified Health System (SUS) was identified in 66.9% and 84.3%, respectively. A feeling of aptitude and ability to deal with health education, health management and health care for the population was identified in most graduates.

Conclusion: We identified good satisfaction at the end of the course and a feeling of confidence for professional performance in most graduates. Improvement through medical residency is a frequent goal among graduates. The SUS is a field of work for most of these professionals. In addition, skills recommended by the National Curriculum Guidelines were perceived by them at the end of undergraduate school. Future studies with larger and multicenter samples are needed to assess the profile of graduates in Brazil.

Keywords: Medical Education; Educational Measurement; Evaluation of Medical School Curriculum; Graduate Medical Education; Teaching.

RESUMO

Introdução: Nos últimos anos, ocorreu um aumento da quantidade de faculdades médicas no Brasil, e, concomitante a isso, houve a ampliação do interesse em melhorar a qualidade do ensino na Medicina. Um questionamento resultante dessa mudança é se esse aumento de faculdades de Medicina implicará a formação de profissionais capazes de atender às demandas da sociedade contemporânea. Uma forma de responder a esse questionamento é conhecer o perfil dos egressos das instituições.

Objetivo: Este estudo teve como objetivo avaliar o perfil dos egressos médicos formados em uma instituição de ensino superior do Nordeste do Brasil.

Método: Realizou-se um estudo transversal do tipo pesquisa de campo com abordagem quantitativa. Egressos do curso de Medicina de uma instituição de ensino superior, formados no período de 2012-2019, foram avaliados por meio de um questionário enviado via e-mail, com perguntas de múltipla escolha. O estudo foi aprovado pelo Comitê de Ética da instituição.

Resultado: Analisaram-se 127 questionários, o que corresponde a uma taxa de resposta de 13,8%, e o sexo feminino predominou ao representar 67,7% da amostra. O conhecimento sobre as Diretrizes Curriculares Nacionais durante a graduação foi relatado por 24,2% dos participantes. A maioria dos egressos demonstrou satisfação com o curso realizado e sentimento de preparo para atuação profissional como generalista. Em relação à residência médica, 90,5% dos egressos realizaram esse tipo de programa de especialização. A atuação profissional dos egressos na Estratégia Saúde da Família e no Sistema Único de Saúde (SUS) foi identificada em 66,9% e 84,3%, respectivamente. Sentimento de aptidão e de habilidade para lidar com educação em saúde, gestão da saúde e atenção à saúde da população foi identificado na maioria dos egressos.

Conclusão: Identificamos uma boa satisfação ao final do curso e um sentimento de confiança para atuação profissional na maioria dos egressos. Aperfeiçoamento por meio de residência médica é um objetivo frequente entre os egressos. O SUS é um campo de trabalho para a maioria destes. Além disso, aptidões recomendadas pelas Diretrizes Curriculares Nacionais foram percebidas pelos egressos ao final da graduação. Futuros trabalhos com amostras maiores e multicêntricas são necessários para a avaliação do perfil dos egressos no Brasil.

Palavras-chave: Educação Médica; Avaliação Educacional; Avaliação Curricular das Faculdades de Medicina; Educação de Graduação em Medicina; Ensino.

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INTRODUCTION

In recent years, there has been a progressive increase in the number of medical schools in Brazil. There were 179 active courses at the end of 2010, reaching a total of 357 medical courses registered with the Ministry of Education in 2020¹, and thus Brazil had a ratio of 2.38 doctors per 1,000 inhabitants in 2020².

In this scenario, a discussion was created about the quality of education provided to future doctors³. Questions then arose about the traditional model of medical education, based on the Flexnerian model, which fragments knowledge through the segmental study of organs and tissues, with a hyperspecialized focus, on the disease and the teacher, with vertical transmission of knowledge^{4,5}.

As a counterpart to these questions, there has been a broad movement towards changes in the pedagogical project of several medical courses, with the introduction of active teaching methodologies, aimed at favoring the training of professionals committed to the health needs of the current population, independent to search for new knowledge and with ethical-humanist training⁶. A landmark for this movement towards change was the development of the current National Curricular Guidelines (DCN, *Diretrizes Curriculares Nacionais*), which lists as appropriate the training of graduate professionals with generalist, humanist, critical and reflective medical skills⁷.

Graduate evaluation is a strategy that allows evaluating the direction of the student's training throughout the course, adapting the profile of the trained professional to that proposed by the DCN, as well as allowing feedback from former students regarding the need for improvements in the course pedagogical project³. Graduate assessment works as a relevant management tool for educational institutions and institutional planning^{8,9}. The Ministry of Education recognizes the importance of evaluating graduates from undergraduate courses in Brazil, which is also part of the external evaluation of Higher Education Institutions (HEIs) through the National Higher Education Assessment System (SINAES, *Sistema Nacional de Avaliação da Educação Superior*)¹⁰.

In view of the above, the aim of this study is to evaluate the profile of medical graduates and the professional performance of graduates from an HEI in the northeast of Brazil.

METHODS

A cross-sectional field research study was carried out with a quantitative approach.

Study participants

The study evaluated medical graduates from a Higher Education Institution (HEI) in northeastern Brazil. As the inclusion criterion, all graduates of the medical course trained

between 2012 and 2019 were invited to participate, evaluating the graduates after possible postgraduate courses. At this HEI, the pedagogical project is based on a hybrid model of dialogued presentations and problem-based learning, in which the student has contact with a practical environment since the beginning of the course.

Individuals who answered the questionnaire and did not sign the Free and Informed Consent Form (TCLE) were excluded, as well as those who completed the course outside this period, for any reason.

Instrument and data collection

A research instrument with multiple choice questions was created based on the questionnaire from the study by Maués et al, 2018, modified with new information related to the National Curricular Guidelines³. This instrument was then validated by an expert in medical education regarding the content and applied as a pilot to check for inconsistencies and doubts regarding the questions.

After approval by the institution's research ethics committee, the consent form and questionnaire were sent in digital format, created using the free tool available on the internet Google Forms, via institutional email. Aiming to ensure data security, anonymity and reliability, the participants were not identified regarding their responses.

A four-week period was established for data collection, with the questionnaire being resent for further collection for another four weeks. The resubmission was adjusted to ensure that each graduate answered the questionnaire only once.

Data analysis

The quantitative data obtained were exported from Google Forms to an Excel spreadsheet (Microsoft®). Continuous variables were expressed as mean or median values, and categorical variables as absolute numbers and percentiles. The open field records were qualitatively evaluated and grouped in the results section according to the content.

Ethical aspects

The research was approved by the Research Ethics Committee of the Higher Education Institution (CAAE: 52320421.8.0000.5049). The research subjects participated voluntarily, with the Free and Informed Consent Form being applied digitally, and were not identified, to guarantee the confidentiality of the responses.

RESULTS

A total of 916 questionnaires were sent, being related to all graduates from the period 2011-2019, with responses

obtained from a total of 127 questionnaires, representing a response rate of 13.8% of the group of graduates invited to participate. In the study, females predominated, representing 67.7% (n=86) of the sample that answered the graduate profile questionnaire. A median age of 32 years and a median time of seven years to complete the medical course were identified.

When asked about reading the DCN for the medical course, only 25.19% (n=32) of the students said they had read it during their undergraduate studies.

Satisfaction with learning and self-confidence for professional performance

The graduates were asked about their level of satisfaction with learning in the five major areas of medical knowledge. Regarding the responses, in the Internal Medicine area, the majority reported being satisfied (72.2%) or very satisfied (17.3%) with the learning. In General Surgery, a total of 59.0% reported being satisfied and 7.9% very satisfied, and in Pediatrics these percentages were 60.6% and 25.2% respectively. In the area of Gynecology and obstetrics, the percentage of satisfied graduates was 55.9% and very satisfied was 15.0%, while in the area of Family and Community Health, the percentage of satisfied graduates was 56.7% and very satisfied, 15.9%. The other distributions are depicted in Figure 1.

When asked about the graduate's feeling regarding their ability to deal with problems related to the five major areas of medicine, during the first year of graduation, the vast majority answered that they felt capable or very capable in the areas of Internal Medicine (78.0 and 3.9%), Pediatrics (53.5 and

10.2%) and Family and Community Health (70.9 and 17.3%). This feeling was lower in the areas of General Surgery (40.9 and 7.9%) and Gynecology and Obstetrics (42.5 and 1.6%). The other percentages are depicted in Figure 2.

When asked about their feeling of security to work as a physician or general practitioner right after finishing their undergraduate course, the majority of graduates answered that they felt secure (48.8%) or very secure (5.5%). The other percentages are depicted in Figure 3.

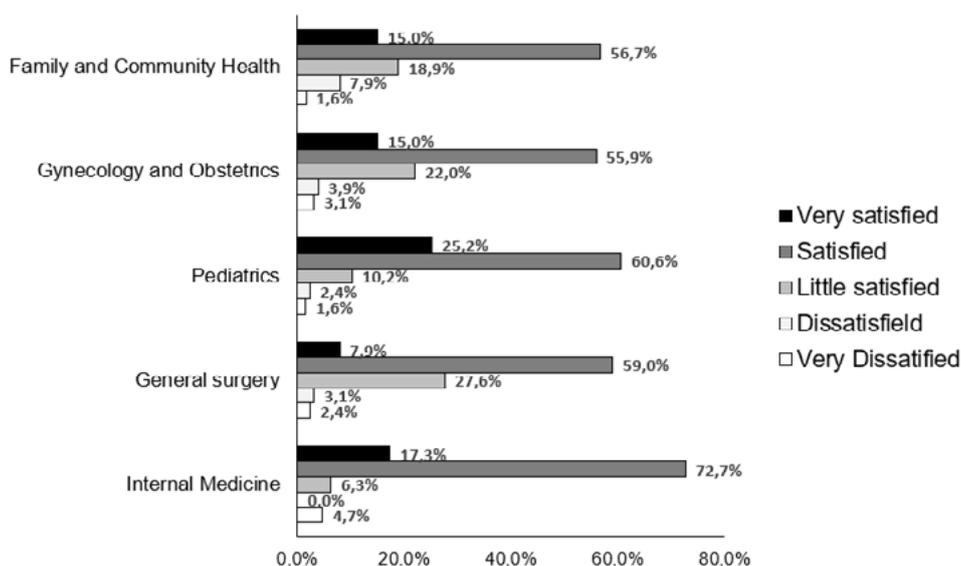
Skills acquired during undergraduate school

Based on the domains required by the DCN for professional training, the graduates were asked about skills acquired and perceived at the end of undergraduate school. The majority answered they felt very competent or competent in the areas of health education, management and care. These results are depicted in Figure 4.

Search for postgraduate programs

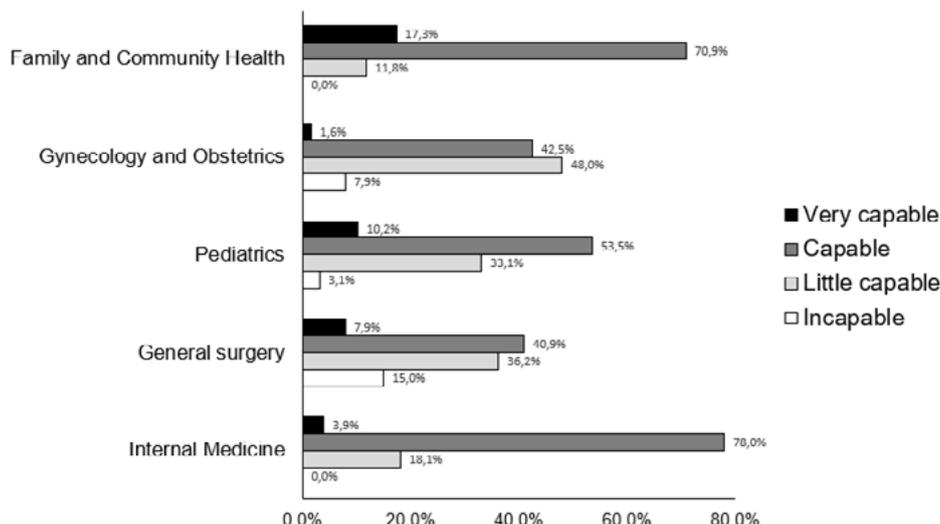
Regarding the completion of a *lato sensu* postgraduate course of the regular residency type, a total of 115 (90.5%) graduates entered the course. Of the total number of graduates, 36 (28.3%) completed only the direct access program. In relation to direct-access residency, the most attended programs were internal medicine by 31 graduates (26.9%), pediatrics by 17 graduates (14.8%), anesthesiology by 14 graduates (12.1%), general surgery by 13 graduates (11.3%) and gynecology and obstetrics by 8 graduates (6.9%). The medical residency in Family and Community Medicine was completed by 2 graduates (1.7%). In relation to

Figure 1. Degree of graduate's satisfaction with learning in relation to the five major areas of medical knowledge (n=127).



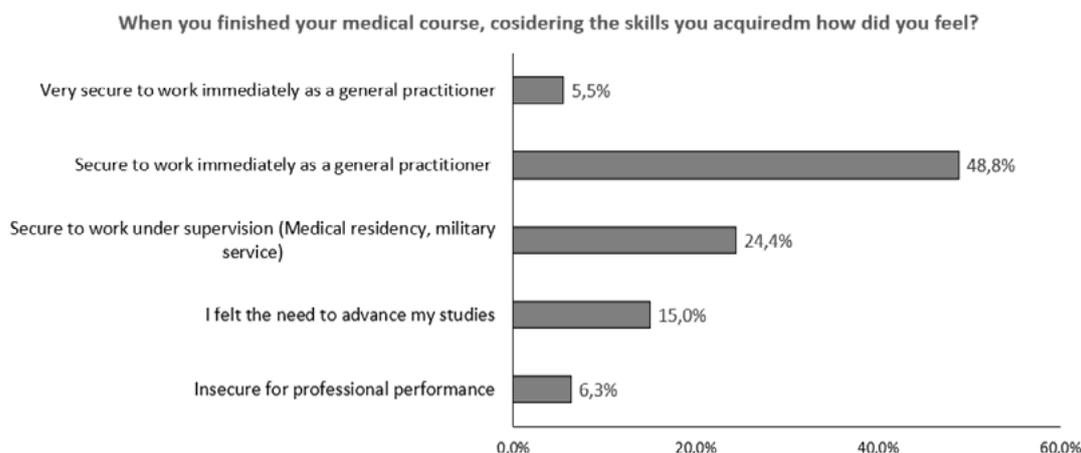
Source: prepared by the authors, 2022.

Figure 2. Graduates' feelings regarding their ability to deal with problems related to the five major areas of medical knowledge during the first year after graduation (n=127).



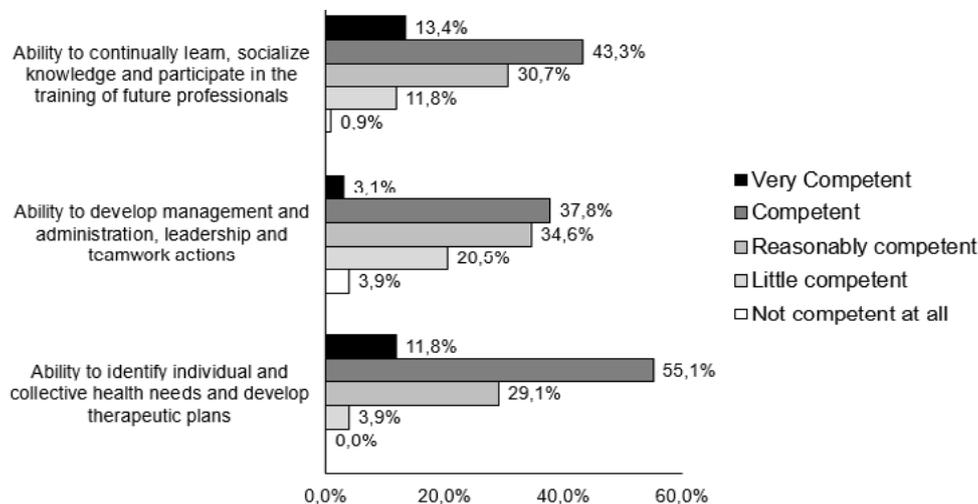
Source: prepared by the authors, 2022.

Figure 3. Graduates' sense of security to work as a generalist physician immediately after finishing their undergraduate course (n=127).



Source: prepared by the authors, 2022.

Figure 4. Perception of medical graduates about the skills acquired during graduation (N=127).



Source: prepared by the authors, 2022.

residency programs with prerequisites, the most completed residencies were Clinical Cardiology by 5 graduates (9.1%), Pediatrics R3 (additional year) by 5 graduates (9.1%), Gastroenterology by 4 (7.2%) and Gastroenterology and Endoscopy by 3 graduates (5.5%). The majority of graduates, a total of 94 (72.4% of the sample), attended medical residency programs in their states of origin.

Regarding the *stricto sensu* postgraduate studies, a total of 6 (4.7%) completed a Master's degree and 13 (10.2%) have a Master's degree in progress. Regarding the doctoral and post-doctoral programs, two (1.6%) completed a doctoral degree and 1 (0.8%) completed a post-doctoral degree.

Search for professional development activities

Considering that the culture of encouragement for professional development is considered an indicator of quality in medical training, measurable through the evaluation of graduates, they were asked about the frequency of their participation in scientific events and their habit of updating through the reading of scientific articles.

Regarding the frequency of attendance to scientific update events, the majority participated at least once annually (38.6%) or once every six months (35.4%), 15% participated at least every 24 months and only 11% had a lower frequency of participation than the previously cited ones.

As for the habit of reading scientific articles or guidelines, as a form of professional updating, the majority read weekly (51.2%) or twice a month (14.2%). The frequency of once a month was identified in 19.7%. Furthermore, we identified that 15% had a lower frequency than those previously mentioned.

Professional performance

Regarding professional activity, 25 (19.68%) work only in the Brazilian Unified Health System (SUS, *Sistema Único de Saúde*), 82 (64.56%) work in the SUS and in the private system and 20 (15.74%) work only in the private or supplementary healthcare system. Furthermore, a total of 85 (66.9%) of the graduates worked in the Family Health Strategy (FHS); however, only 5 (3.9%) currently work in this area.

Professional performance in the health management area was also investigated and it was shown that 32 (25.1%) of the graduates worked as managers throughout their career, but only 18 (14.1%) currently maintain this professional performance.

Regarding participation in health teaching activities, a total of 53 (41.7%) work in medical undergraduate teaching, 50 (39.4%) carry out teaching activities related to medical residency, while 32 (25.2%) do not work and do not intend to pursue an academic career.

DISCUSSION

In the present study, medical graduates were identified as young adults, with a median time since graduation of seven years and specialization via medical residency as a common objective of young doctors. Satisfaction with the completed course prevailed in the majority of graduates. Furthermore, the SUS plays an important role in the field of work for the assessed doctors.

Despite the importance of medical graduates, there has been little published research related to the topic in Brazil in recent years. In the integrative review published by Magalhães et al.¹¹, only eight studies related to medical graduates in Brazil were identified. Most of the analyzed studies were carried out with graduates from the southeast region and no studies were identified with graduates from the northeast.

Regarding gender, females predominated in the study population. This fact has been previously demonstrated in other studies involving graduates in Brazil^{3,12,13}. Furthermore, other studies, where the male gender predominated, had already demonstrated an increase in female participation in the medical profession over time^{14,15}. This phenomenon is recognized globally as the feminization of medicine.

The majority of graduates showed satisfaction with learning during their undergraduate studies in the five major medical areas. In the study by Maués et al.³, the majority of former students showed satisfaction with the medical course (88.23%). In the study by Castellanos et al.¹⁶, 85.5% of the sample considered the course to be good or excellent. This information has a bias related to the fact that the majority of former students participating in the studies may have a positive identification with the HEI. Furthermore, the high rate of completion of preparatory courses for medical residency as a complement to the medical course is another possible bias, as the knowledge acquired extracurricularly could contribute to the feeling of satisfaction with the course. Therefore, a better evaluation would be necessary, with a more representative sample and with questions about extracurricular courses in order to elucidate this issue.

Doctors face several challenges daily, both technical and those related to the healthcare system. Therefore, insecurity about professional performance is not rare at the beginning of one's career. When asked about this issue, 5.51% of the graduates felt very confident and 48.82% felt confident about working in professional care as a general practitioner immediately after completing their medical course. Regarding the five major areas of medical knowledge, more than 50% of the graduates felt at least capable of dealing with problems in internal medicine, pediatrics and family and community health programs. This last area was the one that achieved the highest rate of classification

as very capable, totaling 17.32%. The challenges of general surgery were the ones that generated the most insecurity, as 14.9% of graduates felt incapable of solving these situations at first. Other Brazilian studies also assessed the confidence in one's professional performance of their former students. In the study by Sakai and Cordini Junior¹⁴, the majority of graduates did not feel prepared for professional work after completing the course. In the study by Magalhães et al.¹⁷, 61.6% of the study population felt secure to practice medicine without supervision. In the study by Senger et al.¹³, only 22.9% (pre-reform group) and 27.6% (post-reform group) of graduates responded that they felt confident in working professionally as a general practitioner immediately upon completing college, although the majority (81.7% pre-reform group and 92.9% post-reform group) considered the course as adequate or very adequate in relation to the reality of the professional market. In the study by Maués et al.³, the majority of former students felt prepared for the labor market – fully prepared in 5.88%, prepared but with some deficiency in 33.34% and reasonably prepared in 54.9% of the cases. Therefore, almost all of the graduates of this study felt prepared for professional work, differing from previous studies. This feeling of partial preparation or insecurity demonstrated in work may justify, in part, the high demand for professional development through medical residency.

The issue of confidence in one's professional performance was also assessed in two British studies. In the first study, Cave et al.¹⁸ identified that 58.5% of former students felt well prepared to practice medicine during the first 12 months after graduation. It is worth mentioning that in a certain class, this percentage reached 36.1%. The second study demonstrated that only 48.3% of newly graduated doctors felt prepared for professional practice during the first year of graduation¹⁹. Therefore, insecurity at the beginning of one's medical career is common among graduates in different parts of the world.

Although the majority demonstrated satisfaction with the course, completing a medical residency was a common objective for 90.5% of the assessed graduates. This fact is similar to other studies of medical graduates where specialization through medical residency ranged from 70.1% to 96.7%^{12-17,20}. The search for additional training demonstrates the desire for improvement in medicine, and medical residency is considered the best type of medical specialization in Brazil; therefore, it is apparently a common objective for young doctors. Another perspective would be that specialization through medical residency can be seen as a strategy to reduce insecurity in professional practice, since the doctor would have more training to develop skills specifically in that chosen area of activity. Moreover, medical residency programs are increasingly more competitive due to the limited number of

openings and the growing number of medical schools in Brazil. Therefore, the approval rate could be inferred as an indirect indicator of the quality of undergraduate education; however, this indicator has become increasingly less reliable due to the expansion of preparatory courses for medical residency in recent years. In the study by Magalhães et al.¹⁷, 71% of the graduates took a preparatory course for medical residency. In the present study, we found an even higher prevalence of this type of course (81.1%).

Regarding the knowledge about the DCN, only 25.19% of the graduates stated they had read about the topic during their undergraduate studies. This finding was similar to that found by Maués et al.³, whose study showed that knowledge about most or all of the DCN was present in only 29.41% of graduates. Creating a moment to discuss the DCN during the beginning of the courses would be important for a better understanding of the desired medical characteristics.

The DCN guide generalist, ethical, humanist, critical and reflective medical training. For this purpose, it is necessary to learn general skills such as health care, decision-making, communication, leadership, continuing education, management, a view of comprehensive care and knowledge of the reality in which it operates. The graduates were asked about some aspects of these skills during the first year after graduation. In relation to health education (ability to continually learn and socialize knowledge), our graduates consider themselves to be very competent (14.4%), competent (43.3%) and reasonably competent (30.7%). Regarding health management (ability to develop management and administration actions, leadership and teamwork), the graduates considered themselves to be very competent (3.1%), competent (37.8%) and reasonably competent (34.6%). When assessing health care skills (identification of individual and collective health needs and development of therapeutic plans), the graduates classified themselves as very competent (11.8%), competent (55.1%) and reasonably competent (29.1%). Maués et al.³ studied graduates from a private institution in the capital of the state of Pará in northern Brazil, whose medical course was implemented in 2007, is student-centered and has active problem-based teaching and learning methodologies, very similar to the HEI assessed in the present study. Regarding continuing education, the graduates considered themselves very competent (23.53%), competent (58.83%) and reasonably competent (11.76%). In relation to health management, it showed that graduates considered themselves to be very competent (9.8%), competent (50.98%) and reasonably competent (25.49%). Regarding health care, the graduates considered themselves to be very competent (15.58%), competent (70.6%) and reasonably competent (13.72%). Given these findings, these

skills were probably developed in both institutions, given that the majority of graduates considered themselves at least reasonably competent in these skills. Therefore, it is reasonable to state that the course pedagogical project would be aligned with the graduate profile recommended by the DCN.

Medicine is in a constant process of evolution, and continuing education is part of the medical professional's daily life. Therefore, one's interest and habit of continuing education must be maintained throughout the medical course. In the study by Castellanos et al.¹⁶, 88.1% of the participants recognized the need to take new courses and participate in academic activities. In the study by Torres et al.²⁰, 80.2% of the former students regularly participate in congresses or other scientific events. When asked about their habit of attending conferences, it was found that 74% of the graduates participate frequently in at least one annual scientific event.

The public health sector is the professional setting for most of the study's graduates, given that 84.3% of the doctors work in this sector. Working in the FHS is a common characteristic of medical graduates. In this study, 66.9% of former students have already worked at the FHS; however, it is a temporary job in the vast majority of cases, since only 3.9% of the graduates currently work in the sector. Although the pedagogical project of the assessed HEI aimed at the generalist medical training with practical classes in primary care throughout the initial eight semesters and dedicating four months to the FHS internship, we identified this low prevalence of medical practice in this area. We believe this fact has a multifactorial origin; for instance, the old policy still identified in the country of valuing specialists, economic aspects related to the difference in remuneration between medical specialties and procedures such as exams and surgeries, cultural and educational aspects of the population when seeking the professional who is already a specialist as a solution to health problems, in addition to the fact that, when undertaking a medical residency, there is the motivation to work professionally in specific areas and the abandonment of professional work as a generalist physician.

The medical residency in family and community medicine was completed by only two graduates (1.7%). Recently, medical demography in Brazil was published, and the prevalence of specialists in family and community medicine is only 2.3%²¹, similar to that recorded in the present study. Therefore, these data should be the object of study in future research with medical graduates to better understand the reasons for the low maintenance of professional performance in the FHS.

In relation to working in the public sector in other jobs, the majority of doctors practice medicine in this segment according to research by Sakai and Cordini Junior¹⁴ with 56.6%, by Torres et al.²⁰ with 61.6%, by Purim, Borges and Possebom¹²

with 79% and Maués et al.³ with 94.12%. The study by Souza, Cruz and Cordeiro¹⁵ was the only one that evaluated the professional sector and identified that the majority of graduates did not work in the public sector – only 40% of the participants. Therefore, the public sector absorbs the majority of doctors in the Brazilian labor market.

Teaching is another possible area for medical practice, but the majority of graduates do not work in this area. In this study, 41.7% of former students work in undergraduate teaching and 39.4% work in medical residency teaching. In the study by Castellanos et al.¹⁶, a similar result was demonstrated, since the percentage of the sample working in teaching was 36.1%.

Regarding the fragility of the study, two main points can be highlighted. Initially, a low response rate was observed (13.8%); however, this is a frequent fact in this type of study. All other studies on medical graduates in Brazil achieved a response rate of less than 50%^{3,12-17,20}, with the mean rate being around 29.7%. This fact demonstrates the difficulty in carrying out this type of study on medical graduates throughout Brazil and the need to develop more effective monitoring strategies for graduates aiming to facilitate communication between them and the HEI. Another noteworthy point is the fact that probably students who are closer to the university, valuing it positively, tend to participate with positive responses. Another bias would be the greater probability of graduates with less training after graduation feeling embarrassed and, consequently, shying away from participating in this type of research.

Despite these points, this research represents the best evidence of the profile of medical graduates in the northeast of Brazil, as no other research published with this same objective was identified in this region of the country. Another relevant fact is that a broad assessment of the characteristics of the graduates was carried out. Furthermore, this research can probably stimulate future comparative studies carried out in other HEIs, covering DCN domains.

CONCLUSION

This study identified an acceptable level of satisfaction and professional confidence at the end of the course, in addition to a high percentage of specialization through medical residency programs in basic areas. It was also possible to identify a high percentage of graduates working in the public health system and recognition about preparation for work in the areas of health management, care and education. The present work may encourage future comparative studies with medical graduates from other HEIs in the Northeast or other regions of Brazil, covering the assessed domains and the skills required by the DCN.

AUTHORS' CONTRIBUTION

Ricardo Eustáquio Magalhães, Arnaldo Aires Peixoto, Raquel Autran Coelho Peixoto and Ivana da Ponte Melo: study conception, planning, analysis, interpretation and writing of the manuscript. Abel Brasil Ramos: analysis and interpretation. Maria Helena Marques Magalhães: interpretation and writing of the manuscript.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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