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Professional profile of pediatric intensivists in Rio de Janeiro, southeastern Brazil

Perfil profissional do intensivista pediátrico no Estado do Rio de Janeiro, sudeste do Brasil

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ABSTRACT

Objective: This study described the sociodemographic profile and professional qualifications of pediatric intensive care physicians in the State of Rio de Janeiro (RJ), southeastern Brazil.

Methods: This investigation was an observational, cross-sectional and descriptive study that was conducted in neonatal, pediatric and mixed intensive care units in the State of Rio de Janeiro. Physicians working in the participating intensive care units voluntarily completed a semistructured and anonymous questionnaire. Questionnaires that were not returned within 30 days were considered lost, and questionnaires with less than 75% questions completed were excluded. The differences in neonatal and pediatric intensive care physicians' medical training were compared using the Chi-squared test with a 5% significance level.

Results: A total of 410 physicians were included in this study: 84% female, 48% between 30 and 39 years old and 45% with monthly incomes between US $1,700 to 2,700. Forty percent of these physicians worked exclusively in this specialty, and 72% worked in more than one intensive care unit. Only 50% of the participants had received specific training (either medical residency or specialization) in neonatology, and only 33% were board-certified specialists in this area. Only 27% of the physicians had received specific training in pediatric intensive care medicine, and only 17% were board-certified specialists ($p < 0.0005$ for both comparisons). Most (87%) physicians had participated in scientific events within the past 5 years, and 55% used the internet for continued medical education. However, only 25% had participated in any research. Most (63%) physicians were dissatisfied with their professional activity; 49% were dissatisfied due to working conditions, 23% due to low incomes and 18% due to training-related issues.

Conclusion: These results suggested that the medical qualifications of neonatal and pediatric intensive care physicians in the State of Rio de Janeiro, Brazil are inadequate, especially in pediatric intensive care medicine. A high level of dissatisfaction was reported, which may jeopardize the quality of medical assistance that is provided by these professionals.

Keywords: Intensive care; Intensive care units, pediatric; Intensive care units, neonatal; Education, medical; Professional practice; Brazil

INTRODUCTION

Intensive care units (ICUs) have developed through the last century from the observation that were possible to offer better care to severely ill patients when they were admitted in a single hospital ward, which soon was confirmed to be an effective measure in the reduction of the morbimortality to these patients.[1,2] The first adult ICUs were established in the mid-1960s in Brazil, and the first pediatric ICUs were established

in the early 1970s in Rio de Janeiro and São Paulo. These ICUs spread all over the country, although significant inequalities are still apparent.[3,4] However, intensive care medicine was only acknowledged as a medical specialty in Brazil in 1992.

ICUs undergo constant development with high technological sophistication and well-defined workflows in developed countries. Appropriate financial support and specialized human resources and materials are fundamental to achieve this development[5]. Progress is slower in less developed countries, where many ICUs still maintain inappropriate structure, insufficiently qualified human resources and financial support, which have contributed to higher morbimortality levels.[6-8]

Human resources are important for ICU performance and the quality of care and management. Several studies have shown better quality indicators in ICUs that employ board-certified intensive care physicians as team leaders.[9-16] The relevance of specific and well-qualified training programs for intensivists has also been demonstrated.[11,12,17-23]

This study describes the sociodemographic profile and analyzes the professional qualifications of pediatric intensive care physicians in the State of Rio de Janeiro (RJ), southeastern Brazil. This study is intended to contribute to a better understanding of this specialty in Brazil and subsidize strategic improvement programs.

METHODS

This investigation was an observational and descriptive study performed in the State of Rio de Janeiro, southeastern Brazil. This state includes 92 cities in a 44,000 square kilometers area with approximately 15.5 million inhabitants. All ICUs were identified from consultations to state and federal governments databases and information from medical societies and regional medical councils. The ICUs were categorized as exclusively neonatal (NICU), exclusively pediatric (PICU), or mixed neonatal and pediatric (MICU) ICUs. All ICUs were contacted and invited to participate in the study. All units that consented were included. ICUs that consented but could not be visited during the study were excluded. Eligible physicians in participant ICUs were identified from visits to the ICUs, and consenting physicians completed the questionnaire after signing an informed consent form (ICF). Physicians who had completed the questionnaire in more than one ICU or who did not complete the questionnaires were excluded. This study was approved by the Institutional Review Board of the Instituto de Puericultura e Pediatria Martagão Gesteira - IPPMG, of the Universidade Federal do Rio de Janeiro.

The data were collected from October 2005 to November 2007. A semistructured questionnaire gathered socio-demographic information and data related to physician qualification, certification, continued medical education, participation in research and degree of satisfaction with the specialty. Part A included 47 questions that were completed once by each participant physician, and Part B included 3 questions that were completed by physicians who worked in more than one unit. A questionnaire for each eligible physician was provided to the head of participating ICUs during a visit to the unit. Separate envelopes for the ICFs and anonymous questionnaires ensured confidentiality. Completed questionnaires were placed together in exclusive binders. Questionnaires that were not returned within 30 days were considered lost, and questionnaires with less than 75% of the 50 questions completed were rated as inappropriate.

Sample calculation based on an estimated 900 eligible physicians was performed, assuming that not all of them would participate. With a 5.0% margin of error, 95% confidence level, assuming a normal distribution and a 50% true parameter estimation, a sample of at least 269 participants was estimated.[24]

The results are expressed as numbers and percentages. The differences in the training of neonatal and pediatric intensive care physicians overall and according to the ICU type (e.g., neonatal, pediatric or mixed) were compared using the Chi-squared test with a 5% significance level.

RESULTS

ICU and participant physicians

A total of 100 ICUs were identified; 8 of these units did not consent to participation, and 5 ICUs were excluded due to the impossibility of data collection within the established time frame. Therefore, 87 ICUs (23% PICU, 40% NICU and 37% MICU) were included; 47 (54%) ICUs were private, and 40 (46%) were public.

A total of 1,310 questionnaires were distributed in these units. In total, 810 (61.8%) questionnaires failed to include a signed ICF, five (1%) were inappropriately completed, and 85 (6.5%) were

completed by physicians who had already completed the questionnaire in another ICU. Therefore, 410 physicians met the inclusion criteria (31% of the total distributed questionnaires).

The overall physician characteristics are described in table 1; 84% of the physicians were female, 48% were between 30 and 39 years old, and 45% reported monthly incomes between BRL 3,000 and 5,000 (USD $1,700 to 2,700). Forty percent of physicians worked exclusively in this specialty, 72% of the physicians worked in more than one intensive care unit (35% of them worked in two different places), and 49% worked in both private and public ICUs. The majority of physicians (63%) were dissatisfied with working conditions (49%), the low income (23%) and issues related to specialty training (18%).

Table 1 - Overall characteristics of physicians in neonatology and pediatric intensive care in the State of Rio de Janeiro, Brazil

Variables	N (%)
Gender	
Female	346 (84)
Male	64 (16)
Total	410 (100)
Age range (years)	
20 to 29	54 (13)
30 to 39	195 (48)
40 to 49	112 (27)
50 or more	39 (10)
Not responding	10 (2)
Total	410 (100)
Monthly incomes (Brazilian currency)	
Up to BRL 2,999	94 (22.9)
BRL 3,000 to 4,999	184 (44.9)
BRL 5,000 to 8,000	109 (26.6)
More than BRL 8,000	21 (5.1)
Not responding	2 (0.5)
Total	410 (100)
Number of jobs	
1	108 (26.3)
2	144 (35.1)
3	107 (26.1)
4	35 (8.5)
5	4 (1)
6	2 (0.5)
Not responding	10 (2.4)
Total	410 (100)
Exclusive work (intensive care)	N (%)
Yes	163 (40)
No	243 (59)
Not responding	4 (1)
Total	410 (100)

Continue...

Table 1 - Continuation

Variables	N (%)
Time working in intensive care medicine (years)	
Up to 5	128 (31)
6 to 10	120 (29)
11 to 15	76 (19)
16 to 20	56 (14)
21 to 25	12 (3)
26 to 30	11 (3)
Not responding	7 (2)
Total	410 (100)
Workplace (Unit)	
Exclusively public	138 (34)
Exclusively private	62 (15)
Public and private	202 (49)
Not responding	8 (2)
Total	410 (100)
Professional satisfaction with intensive care medicine	
Yes	144 (35.1)
No - work conditions	128 (31.2)
No - low income	59 (14.5)
No - training in the specialty	46 (11.2)
No - work conditions and training	15 (3.6)
No - low income and training	3 (0.7)
No - work conditions, low income and training	2 (0.5)
No - other reasons	6 (1.5)
Not responding	7 (1.7)
Total	410 (100)

Professional qualification

Table 2 delineates the professional qualification data; 93.4% of the physicians completed medical residency training in pediatrics, and 47% were board-certified specialists in pediatrics (certification from the Sociedade Brasileira de Pediatria [SBP]). The majority (60.5%) of the physicians were trained in neonatal and pediatric intensive care medicine in a medical residency or specialization program. Fifty percent of the physicians in neonatology (NICUs and MICUs) had received specific training in this area through medical residency or specialization, and 33% were board-certified in neonatology by the SBP. However, only 27% of the physicians in pediatric intensive care units (PICUs and MICUs) were specifically trained,

Table 2 - Qualifications and updating of physicians in neonatology and pediatric intensive care in the State of Rio de Janeiro, Brazil

Variables	N (%)
Training in general pediatrics	
Medical residency	383 (93.4)
Specialization	20 (4.9)
None	6 (1.5)
Not responding	1 (0.2)
Total	410 (100)
Training in general neonatology	
Medical residency/Specialization	163 (50)
None	162 (49.7)
Not responding	1 (0.3)
Total	410 (100)
Training in pediatric intensive medicine	
Medical residency/Specialization	64 (27)
None	167 (72)
Not responding	2 (1)
Total	410 (100)
Certification in general pediatrics	
Certificate of specialist	315 (77)
Not certified in this area	92 (22)
Not responding	3 (1)
Total	410 (100)
Certification in intensive medicine	
Certificate of specialist - neonatology	104 (25)
Certificate of specialist - pediatric intensive medicine	29 (7)
Both certificates of specialist	16 (4)
Not certified in this area	258 (63)
Not responding	3 (1)
Total	410 (100)
Participation in scientific events within the last 5 years (absolute number)	
None	48 (12)
Up to 5	164 (41)
5 to 10	137 (33)
10 to 15	37 (9)
15 to 20	12 (3)
20 or more	6 (1)
Not responding	6 (1)
Total	410 (100)
Use of internet (weekly hours)	
Up to 3	225 (55)
3 to 6	141 (34)
More than 6	39 (10)
Not responding	5 (1)
Total	410 (100)

Continue...

Table 2 - Continuation

Variables	N (%)
Journal subscriptions (according to the specialty)	
None	258 (63)
General pediatrics	106 (26)
Intensive medicine	20 (5)
Other	18 (4)
Not responding	8 (2)
Total	410 (100)
Participation in research projects	
Yes	100 (25)
No	304 (74)
Not responding	6 (1)
Total	410 (100)
Participation in studies published in intensive medicine	
Did ever participate	35 (8)
No publication	372 (91)
Not responding	3 (1)
Total	410 (100)

and only 17% were board-certified in pediatric intensive medicine by the Associação de Medicina Intensiva Brasileira (AMIB) in conjunction with the SBP. These results were significantly different ($p < 0.0005$) for both parameters.

Among the neonatal intensivists, of whom 49.7% did not receive specific training; 55% of these intensivists worked in MICUs, and 45% worked in NICUs. This difference was not statistically significant ($p = 0.08$) (Figure 1). However, among pediatric

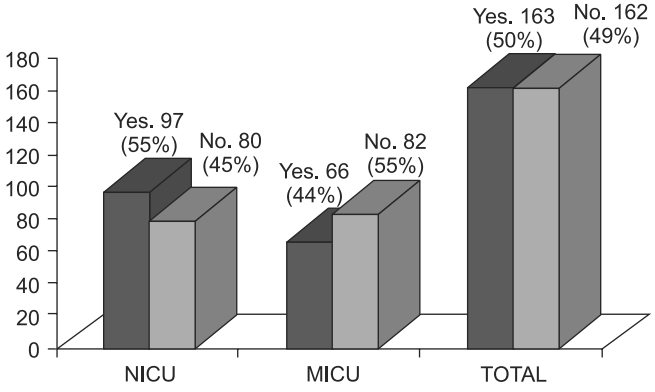

Figure 1 - Number of physicians with specific neonatology training (either residency or specialization). The difference between exclusive neonatal and mixed units was not statistically significant (p = 0.08).

NICU – neonatal intensive care unit; MICU– mixed intensive care unit.

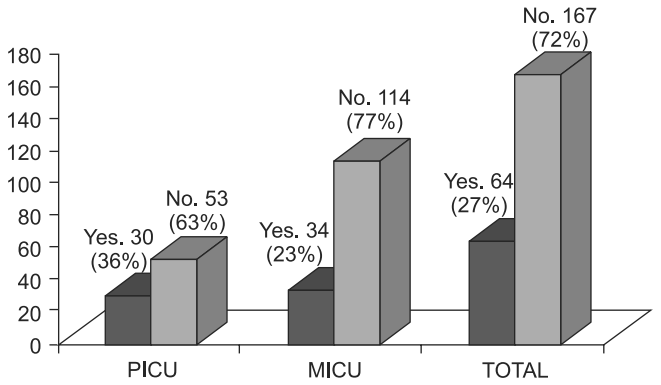

Figure 2 - Number of physicians with specific pediatric intensive medicine training (either residency or specialization). The difference between exclusive pediatric and mixed intensive care units was statistically significant (p < 0.03).

NICU – neonatal intensive care unit; MICU– mixed intensive care unit.

intensivists, 72% of whom did not receive specific training; 77% worked in MICUs, and 63% worked in PICUs. This difference was statistically significant (p = 0.03) (Figure 2).

The majority (87%) of physicians participated in medical events in neonatology or pediatric intensive medicine within the last five years (Table 2). Most (99%) physicians used the internet for updating, and 55% of these physicians used the internet for less than 3 hours/week. In addition, 144 physicians (35%) subscribed to medical journals, but only 14% of these physicians subscribed to specialized intensive care journals. Most physicians (74%) did not participate in research, and only 35 physicians (9%) had ever published in scientific journals.

DISCUSSION

This study describes for the first time the profile of medical professionals in neonatal and pediatric intensive care units in the State of Rio de Janeiro, southeastern Brazil. Our results revealed a similar profile of the medical populations in southeast Brazil and Brazil overall,[25] except for the predominance of females, probably because the preference of female doctors for pediatric specialties.[26]

The training of an intensivist physician is a challenge because of the fast technical and scientific developments in this area, which require the continued training of professionals in intensive care medicine. Some publications define the minimal competencies for ICU medical professionals independently of the unit complexity, such as the European CoBaTrICE.[19,20] The AMIB in Brazil has proposed the adoption of the "Programa de Formação Orientado por Competências em Medicina Intensiva" (ProCoMi), which is based on the CoBaTrICE.[20] The pediatric version is expected in 2012.

The proportion of physicians working in pediatric and neonatal intensive care medicine with no specific training in this area reached 42% in this study. However, it reached an alarming 72% of the physicians in pediatric ICUs, which was significantly greater than neonatal ICUs (49.7%). These findings are likely due to the insufficient training options for these specialties in Brazil, which results in an insufficient number of specialists despite a growing demand. However, Brazilian medical residency committee (CNRM) data report a significant growth in the number of medical residency positions in these areas between 2003 and 2009, from 98 to 210 positions in neonatal intensive care, and from 74 to 300 positions in pediatric intensive care.[27] However, a recent AMIB assessment[28] reported that 30% of the first-year positions were open during 2010. Therefore, the lack of training opportunities is not the only reason for the low proportion of specifically trained doctors.

The number of ICUs has increased by 35% in RJ in the last 10 years,[3] which suggests an increase in the number of jobs beyond the growth in trained professionals. These factors further increase the prevalence of nonspecifically trained professionals. The certification and training results are likely the consequence of the unclear requirements for physicians in these areas in Brazil. The current regulations (e.g., RDC 7-2010, Anvisa)[29] do not specifically require appropriate certification (i.e., training certification in pediatric or neonatal intensive care) or clarify the minimally acceptable qualifications for these areas.

Most of the physicians in this study were trained in neonatology, but physicians' interest in pediatric intensive care medicine has not increased. This result suggests that nonspecialized professionals primarily care for older children in RJ ICUs. Mixed ICUs, which care for newborns to adolescents, should receive particular attention. These ICUs have the largest numbers of nonspecialized doctors. Although no statistically significant difference (p = 0.08) between the numbers of physicians who specialized in neonatology in MICUs and exclusive neonatal ICUs was observed, a clear trend was detected. This

result should be considered in practice. Conversely, the numbers of professionals who were specialized in pediatric intensive care was significantly lower in mixed units than in exclusive pediatric ICUs (p = 0.03). This result demonstrates that these units deserve special attention from their managers, regulatory authorities and continued medical education providers.

Continued education and research

Knowledge is developed from experience and continued education.[30] The Brazilian Federal Medical Council reported that 95% of physicians in southeastern Brazil, answering to a survey, informed that they needed to update their knowledge, and 83% needed to improve their technical qualifications.[25] This study demonstrated that physicians in intensive care units seek professional updates using the internet and scientific events. The internet distinguished for its accessibility, which suggests that the digital inclusion is advanced among physicians. However, the use of this tool for continued medical education in neonatal and pediatric intensive care is limited, as it is utilized for no more than 3 hours/week. Scientific journals subscriptions were low, especially subscriptions to specialized intensive care medicine journals. Our results may not reflect the actual access to specialized scientific journals because only journal subscriptions were assessed. These journals may have been accessed in libraries or internet databases.

In addition, the lack of involvement in research should be emphasized. This result supports the limited participation of Latin countries in scientific production in intensive care medicine.[31]

Professional satisfaction

Work is a relevant part of human happiness, which results from the fulfillment of psychosocial needs, pleasure and the sense of professional contribution.[32] Approximately two thirds of the physicians were dissatisfied with their professional activity in this specialty. Working conditions accounted for the dissatisfaction of approximately one half of the professionals. Low incomes and unsatisfactory training conditions were also mentioned. The teams overload caused by the migration of dissatisfied intensivists to other medical areas and the explosive increase in the number of both private and public intensive care units without an appropriate planning for professional training and qualification may be important issues that contributed to this observed dissatisfaction. This trend is concerning because studies about professional satisfaction have shown a positive likely correlation between satisfaction ant the quality of care.[33] A fundamental understanding of this issue is critical to improving the development of this specialty.

Study limitations

The main limitation of this study is related to the small proportion of eligible physicians that consented to participate (31%). Although the number of eligible physicians was underestimated, (1,310 questionnaires were distributed instead of the planned 900) a new calculation demonstrated that a sample of at least 297 respondents would be appropriate to achieve the same significance level. Therefore, the sample of 410 physicians may be considered, with a 4% margin of error, as a good estimation of the neonatal and pediatric intensive care physician population in RJ state.

In addition, the questionnaire was not validated previously, and in a certain way may be considered limited in its questions. Naturally, further assessments with larger sample sizes and exploration of other significant aspects are warranted.

CONCLUSION

Physicians in neonatal, pediatric and mixed ICUs in the state of Rio de Janeiro have inadequate training in intensive care medicine, especially in pediatric intensive care, when compared to neonatology, and report low levels of satisfaction with their professional performance. These findings suggest possible limitations to the quality of care provided by these professionals and deserve deeper consideration. Strategies for the correction of these deficiencies should be implemented.

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RESUMO

Objetivo: Este estudo tem como objetivo descrever o perfil sócio-demográfico e aspectos da qualificação profissional dos médicos intensivistas pediátricos do Estado do Rio de Janeiro (RJ), sudeste do Brasil.

Métodos: Estudo observacional, transversal e descritivo, realizado em unidades de tratamento intensivo neonatal, pediátrica e mista do RJ. Utilizou-se questionário semi-estruturado, anônimo e individual, respondido de modo voluntário pelos médicos das unidades que participaram do estudo. Foram considerados como perdas os questionários não devolvidos em 30 dias e excluídos os que tiveram menos de 75% das questões respondidas. As diferenças de formação entre intensivistas neonatais e pediátricos foram comparadas através do teste do Qui-quadrado, com nível de significância estabelecido em 5%.

Resultados: Participaram 410 médicos (84% mulheres, 48% entre 30-39 anos e 45% com renda mensal entre US$ 1,700.00 a 2,700.00). Destes, 40% trabalham exclusivamente na especialidade e 72% em mais de uma UTI. Em neonatologia, apenas 50% tiveram formação específica (residência ou especialização) e somente 33% tinham título de especialista nesta área de atuação, enquanto em medicina intensiva pediátrica apenas 27% tiveram formação específica e somente 17% tinham o título de especialista (P<0,0005 para ambas as comparações). A maioria (87%) participou de eventos científicos nos últimos 5 anos e 55% utilizavam a internet para atualização, porém apenas 25% tiveram alguma participação em pesquisa. A maioria (63%) referiu não estar satisfeita com a própria atuação profissional, 49% face às condições de trabalho, 23% por baixos salários e 18% por questões relacionadas à formação.

Conclusão: Os resultados deste estudo sugerem que a qualificação profissional dos médicos intensivistas neonatais e pediátricos do Estado do Rio de Janeiro, Brasil, é deficiente, especialmente na área da medicina intensiva pediátrica, e o nível de satisfação com o exercício profissional é baixo, o que pode comprometer a qualidade da assistência prestada.

Descritores: Cuidados intensivos; Unidades de terapia intensiva pediátrica; Unidades de terapia intensiva neonatal; Educação médica; Prática profissional; Brasil

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